AMERICAN VETERINARY REVIEW,

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NOTICE.—Please address all communications regarding matter for publication, books for Review, Exchanges, etc., to the Editor, 139 and 141 W. 54th St., New York.

EDITORIALS.

NEW YORK STATE VETERINARY COLLEGE.—We have been favored by the President of Cornell University with one of the first reports of this valuable institution, and take this opportunity to present him with our sincere thanks. The report is complete, and in its 90 pages presents a prosperous state of the University and showing a condition of growth and usefulness that few similar institutions in the country could boast of. For us, however, there is in the report a portion which fills but a small space in printing, but which is to occupy a more important one in a few short years, and that is the *New York State Veterinary College*. It is said that "the most important event in the record of the year was the passage by the Legislature of an act to establish a State Veterinary College at Cornell University," and, as we have reported in previous issues, $50,000 have already been appropriated, and, no doubt, more will come from the same source, and will find proper employment.

Every member of the veterinary profession will welcome with pleasure the announcement that the results, so far obtained, are going to bear fruit at an early day. Work in building the necessary accommodations is going on, many of the departments are already filled, and some of the various chairs of the curriculum are occupied; matriculation is to be severe, attendance is to be closely watched, and, above all, the quality of the students is going to be the required condition—quantity will be the last consideration.

If, with all these promises, the attitude of the entire board of officers of the University is taken into consideration, and the resolutions which have been passed at their meeting in June are carried out, it is certain that we can look toward the early establishment of a true veterinary school in this continent. The first which will possess an official position before the people, and which we sincerely hope may prove worthy of the great State where it will be established—a child of the State which will always have and require the support, moral and material, of its mother.

ANOTHER VETERINARY COLLEGE.—From the slip cut out of the *Report*, a Californian paper, we received notice that the establishment of a new veterinary college was contemplated, under the name of the San Francisco College of Veterinary Surgeons. The notice, its reading, the booming which it contains, had a peculiar odor of self-admiration and of quackery, and we feared that a good object was going to be used for personal benefit.

Later on, however, our anxiety has been quieted by the official first circular, which has just reached us, of the California Veterinary College, in which we find the names of several gentlemen reported as millionaires and ready to back up the Board of Faculty, in which we find the names of four veterinarians, three of English and one of American graduation.

The requirements for graduation will be three years attendance and a term of NINE *months*, and we are informed by private notes just at hand is accepted and is a branch of the University of California.

And so on rolls the ball. Three-years' studies are now the order in respectable veterinary institutions. A step which soon will be accepted by all, and in which THE REVIEW takes pride for her successful efforts in behalf of the improvement of veterinary education. But there is another step which we have so far failed to notice, viz.: a change in the formation of Faculty, in the election to professorships. They ought to be granted only

by competition. Which of the schools will inaugurate it? In waiting for action in this great improvement, we send our greetings and best wishes to the new school of the West.

LE ROI EST MORT—VIVE LE ROI.—These words are the closing ones of a farewell address made by our worthy friend George Fleming, to its numerous readers, as editor of the *Veterinary Journal.*

In a long retrospective consideration of the work done by the *Journal*, taking it from its start when the integrity of the Veterinary Corporation in England being menaced by a peculiar action of one of the teaching, schools it was found necessary to establish a publication which would be the organ of the profession, and following the work undertaken to our days, the ex-editor of the *Journal* concludes in saying that the task for which the *Journal* was originally established has been accomplished and then announces his retirement from the hard and difficult, though in many instances, pleasant work, to which he has given so much energy and so much of his talents and time since 1875.

With the modesty that has characterized the whole professional life of our old friend, he tells us that though he is "editorially dead, the *Journal* still lives, possessed of all the "vitality and scientific spirit, and that under the direction of a "much more competent, but perhaps not more enthusiastic "editor, with more resources at command, it will continue its "useful and independent career."

To George Fleming, creator and now ex-editor, we offer our colleagual farewell, with our warmest wishes that he may for several years to come enjoy the happiness of seeing the *Journal* still receiving the support and the assistance of the English reading profession.

MORE ROOM INSIDE.—Another call for a complimentary notice has been made, and the same answer is given—a negative one, of course. What! is the trade dull? Are not the flourishing notices of sufficient attraction? Are the candidates

striking? Of course not, as long as your *prosperous institution* has commenced with a *good atteudane of students from all parts of the continent, the West Indian Islands*, and *even from Great Britain;* and in that case, why say "*Students can still enter*"? Is it the application of the railroad horse-car company's old motto, "Move forward, please; more room inside," with the pulling of the bell for railroading through.

ORIGINAL ARTICLES.

CONTRIBUTION TO THE STUDY OF SERUM-THERAPY IN DIPHTHERIA.*

By E. Roux, M. D., Chief of Laboratory of the Pasteur Institute, and Drs. L. Martin and A. Chaillou, Internes of the Hospitals of Paris.

Serum-therapy is one of the most important questions of the day since the researches of Behring and Kitasato. Tetanic antitoxine was studied first, as being the easiest to obtain and because its preventive action is manifested with a marvellous potency. In practice it has not justified all our hopes, and everyone recognizes the fact that while always useful in tetanus, it is not an absolutely certain remedy. The reason for this is that we are only able to recognize tetanus when contractures occur, i. e., when general poisoning has already taken place. This, however, is no longer a fact in diphtheria, for, while it is also a toxic malady, the poisoning follows the presence of angina or laryngitis, and we are warned, by the presence of the false membranes, before the poisoning has become declared.

Since 1891 we have pursued a series of experiments in the treatment of diphtheria by the antitoxic serum, at first upon animals, and later on children. Before publishing anything on this subject, we determined to obtain a sufficient number of

* Read at the Congress of Hygiene at Buda-Pesth. Extract from the *N. Y. Therapeutic Review.*

facts to enable us to judge the method properly. Now we are enabled to declare that our results confirm, in all essential points, those that have been published by Behring and his collaborators.

1. *Preparation of the Diphtheritic Toxine.*—The animals which furnish the antitoxic serum are immunized against diphtheria, that is to say, they are accustomed to the diphtheritic toxine.

The toxine is produced by cultivating the virulent diphtheritic bacillus in broth, in the presence of air. Under usual conditions, the cultures must be maintained for a number of months at a temperature of 37c. (98.6 F.) in order to allow the poison to accumulate. A more rapid procedure has been recommended by Roux and Yersin ; it consists in making the cultures in a current of damp air.

Flat-bottomed flasks are used, provided with a lateral tube (Fernbach's flasks), containing alkaline broth, peptonized at 2 per cent, so that the liquid layer will be of but slight thickness. After sterilization in the autoclave, they are impregnated with fresh and very virulent diphtheritic bacilli, and the incubator is heated to 37c. When the development has well begun, the bent tube of each flask is connected by means of a rubber tube with a pipe issuing from a copper tube which is itself connected with a water blast pump. By means of screw closers placed on the rubber tubes, the amount of air entering the neck of each flask may be regulated as it arrives after bubbling up through a washing jar. This arrangement is better than that which connects all the flasks together and supplies them all with air from the same current. After three weeks, or four at the most, the culture is sufficiently rich in toxine to be employed. At the bottom of the flasks we see a heavy deposit of bacilli, while the surface is covered with a veil formed by younger microbes. At this time the reaction is strongly alkaline.

All diphtheritic bacilli, even when they appear to be equally virulent for guinea-pigs, do not give the same amount of toxine in the cultures. A trial of bacilli from various sources will

show those that make the largest amount of toxine. No bacteriologist will be astonished to hear that the strength of the toxine is not always the same in cultures made, in all appearances, under identical conditions. Hence it is well to make a large provision of toxine before beginning a series of experiments, so that these may be thoroughly comparable one with another.

The finished cultures are filtered upon a Chamberlain tube and the clear fluid kept in well filled flasks, corked and kept in the dark at the ordinary temperature. Thus prepared, the toxine commonly kills a 500 grm. guinea-pig in 48 hours, with a dose of a tenth of a c.c. After a long time it loses its activity, but very slowly if kept in the manner indicated above.

11. *Immunization of Animals.*—Dr. Carl Frankel was the first who immunized guinea-pigs against diphtheria by carefully inoculating them by injection, with toxine that was modified by heating it to 70.c (158° F.) Then Behring recommended the mixture of toxine with trichloride of iodine. He now prefers to inject very small doses of pure toxine at sufficient intervals to allow the animals to remain healthy. Brieger and Wasserman obtain the result by injecting a culture of diphtheritic bacilli in thymus broth, after heating it to 65-70c. for a quarter of an hour. All these processes are successful, but it should be well understood that the thorough immunization of small animals, such as rabbitts and guinea-pigs, is always a lengthy and delicate operation.

The method which we prefer is that which employs the iodized toxines used by Roux and Vaillard in their researches upon tetanus. Diphtheritic toxine combined with iodine is much less dangerous than pure toxine. Just before using the toxine we add one-third of its volume of Gram's solution, and then the mixture is injected under the skin. A medium sized rabbit can stand from the first half a cc. of this liquid ; after a few days the injection is repeated and this is kept up for several weeks, after which we may increase the amount of iodized toxine or lessen the proportion of iodine. Later still pure

toxine will be given. The animals must be frequently weighed and the injections be interrupted if they lose weight, otherwise they get into a cachectic state which ends fatally. In these experiments we gain time by going slowly.

Dogs have furnished to some experimenters, among whom Bardach and Aronson, a very active serum. Sheep, especially goats, are very sensitive to the action of the diphtheritic poison.

The immunization of females which give a good deal of milk, such as goats and cows, presents a peculiar interest, since Ehrlich has shown us that the antitoxine passes in the milk. A milch cow, that is well immunized, is a source of antitoxine. Its milk is, of course, far less active than its serum, but the antitoxine which it contains may be condensed within a small volume, and hence is a good primary material for the preparation of antitoxine.

Of all animals capable of furnishing large amounts of anti-diphtheritic serum, the horse is the easiest to immunize. It bears the toxine much better than the other animals we have mentioned. We often see horses that have received from the first a dose of two to five c. c. of strong toxine, injected under the skin, and which present only an ephemeral febrile movement and a local œdema which rapidly disappears. The ass also bears the toxine well. If we admit, with Behring, that the serum of an animal is all the more antitoxic and he shows the greater sensitiveness to the toxine, the choice of the horse may appear as a bad one. But, since 1892, we began to immunize horses against diphtheria because, following the results obtained by Roux and Vaillard with tetanus, we knew that serum of horses is inoffensive for animals and for men, even when injected in large amounts. When injected under the skin it is immediately absorbed, and without local reaction. Moreover, nothing is easier than to take from the jugular vein of a horse, as frequently as it may be desired, and perfectly pure, large quantities of blood from which a perfectly limpid serum may be removed. We have some horses from whose jugulars, by

means of a large trocar, blood has been removed more than twenty times, the vein remaining as supple and as permeable as on the first day. Their immunizing power is in the neighborhood of 100,000 and it would be easy to increase it.

Our immunized horses are cab-horses from six to nine years old, who are feeding well, and have no organic disease, especially of the kidneys, and which have been discarded from work for injuries to their legs. First of all, it has been ascertained that they do not react to mallein, and hence are free from glanders.

In order to immunize our horses we inject gradually increasing doses, under the skin of the neck or back of the shoulders, of a toxine of a great activity and able to kill, in doses of 1-10 c. c. in 48 hours, a guinea-pig weighing 500 grammes. In two months and twenty days, one of our horses received more than 800 c. c. of toxine, without manifesting anything but a transitory local œdema and a rise of temperature of 1° C., (1 4-5° F.,) on the evenings after he had received a copious injection.

On the same day that this horse was bleed for the first time (87th day of the experiment), he bore an introduction in the jugular of 200 c. c. of diphtheritic toxine without being incommoded by it. In the evening he had a slight fever, but did not lose his appetite.

The serum so removed has a preventive power superior to 50,000, i. e., a guinea-pig proves resistant to an inoculation of a half a cc. of very recent and violent diphtheritic culture if, twelve hours before, he has received a quantity of this serum equal to the 1-5,000 part of his weight. A mixture of 1-10 cc. of this serum and one cc. of toxine does not cause local œdema in the guinea-pigs under whose skin it is injected.

The horse is therefore the best animal that can be employed in the preparation of the anti-diphtheritic serum. His indifference to the toxine of diphtheria spares the experimenter many difficulties that are experienced with more sensitive animals.

When the horses have been brought to a sufficient degree of

immunity, it is a question whether it is best to maintain this immunity by means of frequent subcutaneous injections of small amounts of toxine, or by the occasional introduction of larger amounts within their veins. The second process is the handiest, the toxine (300 to 500 cc.) is injected at the time the animal is bled, and he is allowed to rest for about twenty days, but it is less efficacious than the first. In experiments on the immunization of animals against tetanus, Vailliard and Roux found that the most active serum was obtained by multiplying small injections of toxine. The same is true in diphtheria. It would seem that the cells must be frequently excited in order to constantly secrete antitoxine.

III. *Anti-diphtheritic serum.*—When a certain amount of the serum of an animal, that has been immunized against diphtheria, is added to diphtheritic toxine, the latter becomes harmless. The mixture, made in proper proportion and injected to animals, causes them no trouble and does not even determine a local reaction. The toxine appears to be saturated. This action not only takes place *in vitro*, but also occurs within the body. An animal protected by a sufficient dose of serum will not be affected by doses of toxine that would prove mortal in other animals. The toxine may even be injected first, and the serum several hours later, and the animal will not die. Of course the amount of serum needed to save him will vary according to his weight, to the dose of toxine that has been given, and to the moment at which the intervention is decided upon. The serum is preservative and therapeutic, not only for the toxine, but also for the living poison. These properties, discovered by Behring, are the basis of the treatment, and are due to a special substance called antitoxine, whose nature is as much hidden to us as that of the toxine itself. These two substances possess common characters; they are altered by heat, precipitated by alcohol, and carried down by divers amorphous precipitates which may be produced in the liquids in which they are in solution. These peculiarities are common to nearly all the preventive or antitoxic substances which exist in the serum

of animals that have been immunized against various infectious diseases. The only thing that distinguishes one from another is the specific action of each upon a determined virus or poison.

The animals which receive the diphtheritic antitoxine become refractory to the disease in a very short time. The immunity is established at once, but it does not last, it disappears within a few days or weeks, according to the potency of the dose of the serum that has been administered. This temporary immunity is very different from that which is acquired by the slow process that we have described.

What action is exerted upon the toxine by the anti-diphtheritic serum? Are the two substances neutralized or do they exist side by side? If they are not saturated, why are the effects of the poison no longer manifested? It appears as if the toxine must be destroyed. But a mixture which gives no effects in a guinea-pig will still act in a rabbit, in which it produces a marked œdema of the tissues in which it is injected. The results will change with the mode of experimenting. We can only say that the anti-diphtheritic serum is not antitoxic in the true sense of the word; added to the toxine, it leaves it intact; injected in animals, it acts upon their cells, causing them to lose their sensitiveness to the poison. The proof of this is seen in the fact that an amount of serum which preserves an ordinary animal will fail to save one that has been weakened beforehand by injections of other microbes or microbic products. If the antitoxine destroyed the toxine, a given amount would be efficacious in all guinea-pigs of a given weight. The natural explanation of these facts must reside in the action of the serum upon the cells. The lively cells of a healthy animal respond to the stimulation of the serum, whereas in an animal that appears healthy, but who has been weakened previously by microbic injections, these cells are unable to protect.

The study of phagocytic reaction in diphtheria has been undertaken at the Pasteur Institute by Dr. Gabritchewski; the results he has obtained bear out the fact that preventive serums are stimulant rather than truly antitoxic.

The serum that we obtain from horses keeps very well, without alteration, for all manipulations are performed with the greatest possible cleanliness. It is kept in the dark, in sterilized flasks, to which nothing but a piece of melted camphor is added. The serum which is dried *in vacuo* can easily be sent at a distance, and reassumes its preventive qualities when dissolved in eight or ten volumes of sterilized water. This solution gives rise to a slightly transitory local swelling, which is never seen with the natural serum.

It may prove useful to condense an antitoxine which, as in milk, is too greatly diluted, but it appears to us to be a uselessprocedure to condense a serum which must again be diluted.

IV. Action of the Serum in the Diphtheria of Mucous Surfaces.—Most experiments in serum-therapy have been practiced on animals under whose skin the substances were injected. Behring and his co-laborers have mentioned several, however, in which the injections were practiced upon the mucous membranes. These are very interesting, since, in practice, we do not find that diphtheria is developed in the midst of the tissues, but upon the mucous surfaces of the throat and larynx. Hence we should cause a diphtheria of the mucous surfaces of animals, and see how it behaves under the action of the serum. This is the best way of preparing for the actual treatment of children.

It is very easy to give a vulvar or vaginal diphtheria to a female guinea-pig. The mucous surface of the vulva and the vaginal entrance may be scratched, as was done by Lœffler, or, better still, may be slightly cauterized with a heated glass rod. Then the diphtheritic germs are applied. In a few hours there is redness and swelling, and the œdematous mucous membrane becomes covered with a grayish, adherent false membrane. There is strong fever, a vaginal discharge, and in two or three days we see the evidences of general poisoning ; the animal loses flesh and dies. This process has the advantage of showing the evolution of the local process, and the modifications brought about by treatment. This false membrane is of the

same nature as that observed in children, and contains diphtheritic and foreign bacteria.

1. *Serum injected preventatively.*—Female guinea-pigs always resist the action of the virus when a sufficient amount of the serum is injected prior to the vaginal inoculation. In proceeding in the manner already described, there always occurs a false membrane ; but, while in the control cases there is a red and œdematous mucous membrane, with high fever, and a bad general state, the treated females show less extensive redness, less swelling, and a mild degree of fever. From the second day the local lesions diminish and the mucous membranes show a beginning reparative action. Females of the same weight were experimented on. Those that were unprotected died on the sixth day, while those which received a preventive inoculation equalling 1-10,000 part of their weight recovered. When the dose of serum is not sufficiently strong, the animals apparently recover, but succumb later on to cachexia. The same things occur if the serum is injected at the same time that the inoculation is made.

False membranes may also be produced on the ear of rabbits. A rubber ring is first placed around the ear, to cause a slight œdema. Then the skin is lightly burned and inoculated with diphtheritic bacilli. The rubber ring is then removed, and, as the exudation keeps the surface humid a fine false membrane is formed. By microscopic sections of such ear at various stages of the disease it is very easy to study the changes that occur in the tissues.

2. *Serum injected after inoculation.*— The false membrane is well developed after twelve hours, and the redness and swelling of the vulva are marked. If, at this time, an injection of serum of from a 10,000th to a 1,000th part of the weight of the animal is made, the animal will recover very well. A few hours after the œdema is arrested the swelling diminishes, and on the second day the false membranes become detached. When the mucous membrane is healed no more diphtheritic bacilli can be found.

One is astonished at the rapidity with which the false mem-

branes become detached and disappear, when these guinea-pigs are compared with control ones that die with extensive lesions of the vagina in five to six days.

3. *Action of the serum on animals whose tracheas are inoculated.*—Tracheal and laryngeal diphtheria is, in children, by far the most severe form. The bacillus often invades the lung, when the absorbing surface becomes enormous and the poisoning is very rapid. Besides, the respiratory difficulty may call for tracheotomy, in which the wound itself facilitates secondary pulmonary infection and increases the danger.

In order to properly judge what results we might obtain in actual practice, it was therefore necessary to experiment with animals whose trachea or larynx were involved.

Rabbits are best for this purpose. The trachea is incised, the mucous membrane scratched with a platinum needle and then inoculated with the needle charged with diphtheritic bacilli. The wound is then closed. On the morrow these animals have fever, in 48 hours the breathing is uneasy and noisy, as the false membranes keep developing ; one can even perceive, at a distanced, a very characteristic noise.

Guinea-pigs so inoculated commonly die in three days when not treated. Rabbits die in from three to five days. In these animals the trachea and the larynx were injected and false membranes covered the mucous surfaces and often extended to the first ramifications of the bronchi. The lungs, congested in spots, showed a few bacilli.

When guinea-pigs or rabbits are thus inoculated, after having received an injection or preventive serum, they do not acquire diphtheria, or, at any rate, they show no manifestations of it. When the amount of serum is insufficient the disease stops for a time, and then there is a relapse. In some instances, after too small an injection, we have seen guinea-pigs go through a mild diphtheria and die two months later with lesions of the kidneys and the suprarenal capsules.

If the serum is injected after inoculation there is an arrest of the evolution of the diphtheria.

4. *The anti-diphtheritic serum in diphtherias complicated by the association of other bacteria.*—The diphtherias thus associated with or complicated by the presence of other bacteria, especially the streptococci, are among the most severe that are to be seen. Most frequently the disease involves the lungs, which, at autopsy, show foci of broncho-pneumonia, wherein are found the diphtheritic bacilli and the streptococci. Roux and Yersin have already shown that a virus of small virulence may become deadly for guinea-pigs when inoculated at the same time as a streptococcus not very virulent by itself. Is the anti-diphtheritic serum capable of curing these complicated cases? This constitutes a question of the greatest interest on account of the frequency of the existence of these mixed forms in children. Dr. Funk has investigated it, and finds that this simultaneous infection determines an increase in the production of the diphtheritic toxine, but that the presence of the streptoccus does not prevent in any way the neutralizing effects of the antitoxine. Hence, in these cases, we must simply inject larger amounts of antitoxine.

Funk inoculates under the skin; we inject in the trachea so as to imitate as closely as possible the actual conditions of practice. The bacilli and streptococci were inoculated in the manner mentioned above. The streptococci had been taken from a diphtheritic child, and were therefore one of those forms that are found in associated diphtherias. Isolated in a pure culture, it does not cloud broth and is not very virulent for rabbits. Two cc. of a recent culture in broth, injected in the veins of a rabbit, only kills him after ten days. One cc. introduced under the skin causes an erysipelatous sore, with transitory fever, and without serious disturbance of the health. The same amount placed in the trachea of a tracheotomized rabbit gives it a brief elevation of temperature without pronounced malaise. The diphtheritic bacillus added to it is the same virulent one that has served in our other experiments.

The association of these two microbes produces in rabbits a diphtheria running a rapid course, as seen in very young

children. The anatomo-pathological lesions are the same. In both cases there is broncho-pnemonia with abundant bronchial secretion.

In these cases of associated diphtheria the serum but rarely cures. This is not because there is a formation of larger amounts of diphtheritic toxines, or because the antitoxine action is hindered, but because the cells that are stricken by the poison of the streptococci no longer feel the stimulation of the antitoxine. In a number of other experiments the animals treated 12 hours after the inoculation invariably died, notwithstanding repeated injections of the serum. We frequently saved rabbits, treated seven or eight hours after, by repeated injections of serum. It is here important to repeat the injections in order to be assured of a definite cure.

Would we obtain better results in these associated cases by the simultaneous injection of anti-diphtheritic serum and the serum of rabbits immunized against erysipelas? Dr. Marchoux, of the Pasteur Institute, has supplied us with a serum of this sort which, however, has as yet failed to give us good results, though a rabbit inoculated with it outlived for several days a control rabbit. Perhaps this serum was not sufficiently efficacious against the sort of streptococcus that was employed.

NOTES UPON MALLEINE.

By Prof. E. Nocard, of Alfort.

These are the resume of many experiments made with my friend, Dr. Emile Roux, of the Pasteur Institute, which have been made upon over *nine thousand* horses with the malleine prepared at the Institute which above all qualities has the advantage of being always the same and identical to itself in its action.

This quality is due to its mode of preparation. We use, as unique seed or element (semence) a glanderous bacillus whose

virulency, through continued generations upon rabbits, has been brought to its maximum of intensity and keeps it; and since 1891 we have always kept this condition of glanders to the same degree of virulency; in using the pulp of the spleen of a rabbit that died 36 or 48 hours after an intra-venous injection, several tubes of potato cultures have been freely planted, and after three days of standing in a temperature of 37° the product of a culture is diluted simply in a little quantity of boiled water, filtrated on linen and injected into the vein of the ear of a rabbit whose spleen will serve to the planting of other potatoes and so on. These potato cultures are not used for the preparation of the malleine but only to the cultivation of a glanderous virus with a high and always even virulency.

To prepare malleine, we used cultures made on glycerined bouillon, according to the formula that we have given for the culture of the bacillus of tuberculosis. *

Veal or horse bouillon, common salt, ½%, peptone, 1%, glycerine, 5%.

Twenty-five to 30 bottles each of the capacity of 250 cubic centimeters and containing glycerined bouillon are planted at the same time, after a month of standing in the oven, the cultures are sterilized to the autoclave, then concentrated by evaporation in the water bath to the 10th of the first volum, then filtrated on Chiardin paper—thus is *brute malleine* obtained —that is a seripous liquid, of dark brown color, with aspeiral odor, somewhat vicous in aspect. Brute malleine containing 50% of glycerine can be kept a long time, almost forever, away from the light and heat. In practice we have used it diluted to the 10th or to the 8th with phenic water at 0.5% or better in boiled water—but in this care the solution must be used as soon as it is prepared.

1. In glanderous horses, the injection of the minimum quantity of malleine (one-fourth of one cubic centimeter of brute

* *Nocard's Rome.*—(Sur la culture du bacille de la tuberculose—Annales de l'Institut Pasteur, 25 Janvier, 1887. Page 27.)

malleine or two cubic centimeters in malleine diluted to the 8th) gives rise to a characteristic reaction.

In a few hours, at the seat of inspection, there appears an inflammatory tumefaction, warm, tense, very painful, always large, at times enormous, from the circumference of which start lymphatic sinuous tracts or cords, also warm and painful, extending to the surrounding lymphatic glands—when malleine is aseptic and the injection made aseptically, this tumour never suppurates, it increases for 24—36 hours and remains for several days, then it slowly diminishes, by degrees and disappears only towards the 8th or 10th day.

As the tumour appears, the general condition of the animal undergoes great changes ; he becomes dull and heavy, the face is contracted, the look anxious, the hair dry and staring, the flank is stucked up, the respirations accelerated, the appetite is suppressed, often he has frequent tremblings of the olecranon or crural muscles, or even the trunk is taken with strong convulsive contractions ; if the animal is made to move its miserable appearance, stupor and deep prostration are surprising, the most powerful, active or even dangerous is entirely changed, he is weak, and indifferent to all surroundings. These general phenomena constitute what in France we call the *organic reaction*, they are not always as severe, and though they may vary in severity they are never entirely wanted.

By opposition the *thermic reaction* is never absent. In a few hours the central temperature of the glanderous horse rises gradually from 1°5, 2°, 2°5 and even more above the normal. I have seen one case in which the hyperthermic brought on by the injection of malleine rose, after the 10th hour, 4 centigrade degrees (from 38°2 to 42°2).

The elevation of the temperature already visible from the 8th hour after the injections, lasts a long time ; reaching its maximum between the 10th and 12th hour, at times even after the 15th and more rarely towards the 18th hour.

A fact important to notice is that the phenomena following in glanderous horses the injection of malleine lasts a long time;

after 24, 36 and 48 hours they still persist ; there is prostration and the temperature remains above normal of more than one degree.

2. In healthy horses, on the contrary, the injection of malleine, even in much larger quantity is without effect ; the temperature remains normal, the general condition is not modified, and at the point of injection there is only a small tumour, œdematous, slightly warm and little painful which instead of increasing, diminishes rapidly and completely disappears in less than 24 hours.

3. The reaction following the injection of malleine is altogether specific, when it exists it allows the rapid and certain affirmation of the existence of glanderous lesions, even the the smallest ; when the reaction fails one can be certain that the animal experienced upon has no glanders, whatever may be the appearance of the suspect lesions, or the result obtained by the inoculation of their products. Ulceration of the pituitary membrane resembling chancres of glanders, purulent lymphangitis resembling so much farcinous cords, and even producing a suppurative orchitis in the guinea-pig, are in this way readily distinguished from glanderous lesions.

4. The use of malleine cannot give truly useful indications unless all possible causes of error are avoided :

(*a*) It would be imprudent to employ it in animals already feverish, the indications of the thermometer might be affected by it and bring on an erroneous conclusion.

(*b*) Animals submitted to the experiment must not be exposed to atmospheric variations (sun, fogs, rain, wind, etc.). If most of horses are more or less unaffected by the influence of these causes, some are not, and outside of other causes may by them exhibit variations of central temperature of 1° 5, 2° or even more. Serious errors might follow such experiments, specially if the indications of the thermometer were only taken in consideration.

(*c*) And lastly, one must not forget that some diseases, distemper for instance, are often accompanied with daily oscilla-

tions in the temperature of the patients. When cases of this kind are suspected, one must be certain that the hyperthermia following the injection of malleine is lasting, and that the organic reaction is also present.

5. It is seldom that a case of glanders remains isolated in a stable containing a certain number of horses; the rule is that other animals become affected in their turn. But, before presenting evident and visible signs of the disease which indicate the need of sanitary precautions for them, they may have already spread the germs of the disease and contaminated other animals.

Injections of malleine allow to ascertain that, in such a case, the number of animals really contaminated is always greater than one would suppose if depending only on the simple clinical examination.

If the animals thus condemed by the malleine are, all or only some of them destroyed, the examination of their lungs will always reveal lesions of glanders, at times in great number, or again limited and represented only by small rounded nodules, firm to the touch, of the size of a millet seed, yellowish or greyish in color, semi-transparent, homogemous in their entire thickness, without fibrous wall on their periphery, without caseous softening in their center; the glanderous origin of these *translucid tubereles* is no longer a doubt in our days.

But if, instead of destroying horses condemned by malleine, they are kept isolated, away from any chance of new contamination, only a small number of them will sooner or later exhibit the clinical signs of glanders; while the others will remain with all the appearance of health, will be returned to their work and none will become glanderous.

If, while they are kept isolated, these horses are periodically submitted to the test of glanders, the number of those that will react will gradually and at each test diminish in such a way that, after several months, most of the animals which had been condemned by the first inspection may be considered as healthy; they behave like those which had not reacted at the first test, they never present any symptoms of glanders, neither do they

contaminate others. One then can conclude that the glanderous lesions detected by the first injections have definitely *recovered* (healed).

How do these horses recover? Has malleine contributed to the recovery? In what limits?

At the present hour, it seems difficult to answer these questions in a satisfactory manner. It is possible, even probable, that malleine exerts a favorable action upon the regression and the definitive cicatrization of the glanderous lesions, when these are recent and of limited extent, but it is impossible to affirm it.

The severe individual isolation, the long and continued æration, good food were sufficient in days gone by to arrest in a few months the most dangerous epizootics, and then malleine could not be given the credit of a curative action. Neither do I believe that we are prepared to decide as to the part that malleine may have taken in the numerous cases of recovery of pulmonary glanders that we have to record to-day.

6. From all that precedes, it results that the systematic use of malleine constitutes the surest, the quickest and less expensive means to relieve the most seriously affected centers of glanders.

VETERINARY EDUCATION IN RELATION TO THE PRACTICE OF VETERINARY MEDICINE IN NEW YORK STATE.

By Prof. Liautard, M.D.V.M.

A paper presented to the New York State Veterinary Medical Society.

Mr. President and Gentlemen:—To be called at this moment before such an honorable gathering of members of the veterinary profession is an honor which, to me, comes to crown a period of thirty years engaged in behalf of the profession; and when I am asked to address you on the subject of veterinary education in relation to the practice of veterinary medicine, you can appreciate how I realize the compliment and yet how regretful I must be of what I consider my inability to do justice

to the subject. . . . I hope, therefore, that while you will accept my warm thanks for the honor devolved upon me you will also receive my remarks with indulgence and with the assurance that it I err in my conclusions it will be with the firm belief that I am speaking for what I consider a good cause.

The subject of legislative regulation of the practice of veterinary medicine in the state of New York is one of the natural consequences of the well-deserved reputation and past history of the state, namely that of being the *one* in the Union where higher education is the principal aim of her citizens. The *first* in almost everything, New York State has been the leader in witnessing the establishment of veterinary schools on comparatively solid foundations, even if those are the results of private undertakings: she was the *first* where, for higher standing of her veterinarians, her veterinary schools were seen to require a matriculation examination, and she was among the *first* in the endeavors which were made to obtain legislative action to regulate the practice of that branch of medicine. The first act in that direction being passed by the Legislature in Albany in 1884.

But these were only the first steps in the right direction. The profession has made great strides towards improvement since the day when the first veterinary school had opened, her school in New York City in 1864; a daring step had been taken by the American Veterinary College when, in 1875, candidates to her degrees were requested to pass an examination before they could matriculate and enter her lecture-room, and though this examination continued to be made more severe and more difficult little by little, they were and are yet inadequate to the requirements and to the qualifications of the educated veterinarian.

In former days, as many of you may remember, and up to last year the requirements of our veterinary colleges (I speak of those in this state) were: an attendance of two courses of lectures; first, those were only short sessions of a Winter course of 4 to 4½ months; then a Spring session was added, making the course 6 months; then came the two-year course of 6 months each; and now we find in the American Veterinary

College a requirement of attendance at three winter sessions at 6 months each, which will be increased to 8 months in a short while.

This result has been reached by degrees as you see, and if we have arrived at this point, if among the successful veterinarians of this Excelsior State we can count many of the alumni of the schools from New York, if we can boast of the progress made by our profession, of the standing to which the veterinarian has reached, there is no doubt that it is due to the fact that our colleagues are possessed of higher education and are ambitious to increase their professional knowledge, reared in that direction as they were while at college, where they were admitted with more or less difficulty and already in possession of a self desire for more knowledge and a comprehension that *knowledge* and *education* are *inseparable.*

Does all this however mean that though we have so far advanced, we have reached the limit of our needs—our veterinarians are far better educated than they were some years ago—but does it mean that still higher education is unnecessary—or would be superfluous?

Evidently no, and I am quite certain that the days are not far off when in the United States, the standard of veterinary education will be that which has for years existed on the continent and lately established in England, viz., an obligatory attendance at college of four sessions of at least eight months each.

Of course this will have to be reached by slow progress—but with it, another condition will have imposed itself, viz., *higher education before matriculation.*

Like in my studentship time, an ordinary good, though special, education was only required and to-day a degree of bachelor of science or of arts is demanded by the French schools, the same will be demanded here; this in fact already exists. Several of the American Veterinary College Alumni had received the A.B. or B.S. before the D.V.S. was added to their names.

But how long has it taken for European schools to reach that point?

If Lyon and Alfort are a century old and if it is only at the end of those hundred years that such facts have been accomplished. Can it be expected that after an existence of only thirty years, we can accomplish it?

The progress that has so far been made, as results of *required improved education* are too evident for me to dwell upon.

The class of practitioners, of the young men who enter the profession now are far superior to those of years gone by; the work that has been accomplished by the members of the veterinary profession has spoken by its results—greater public consideration is now granted to the veterinarians of to-day as compared with that given to the old self-made practitioner; legislative bodies are listening to our claims and the Regents of the University of the State are devoting some of their valuable attention to the subject of veterinary education and the regulation of the practice of veterinary medicine in the State of New York. From all these we realize that we are coming close to the period I was alluding to a moment ago.

As you are aware, a bill was presented at the last legislature in relation to those important subjects.

Framed upon the medical bill now in force in the state, the bill recommended the creation of a board of veterinary examiners, specifications were presented as to the duties of that board, as to the qualifications of those who would be allowed to present themselves for examination before said board and also as primary requirement, were the essentials for matriculation and graduation from our veterinary colleges.

The principal object of the bill was higher education, and on that no one can object it—myself last of all—but as long as we are now speaking on this subject, I hope you will allow me a few remarks on some of the requirements of the bill.

The creation of a board of examiners is one that I cannot too strongly indorse. I have on previous occasions and in various papers pointed out the importance I attach to the existence

of such board, and if I erred in calling for a national board, overlooking as I did the difficulties that exist in the creation of such a body through the fact of state rights, I am perfectly satisfied to see the plan started to-day in each individual state; until the moment has come, when the importance of the veterinary profession will have been proved so powerfully as the guardian of our national agricultural wealth, the Federal government will then take hold of it in the proper way and make it one of its national institutions as it is in the old world.

The conditions of admission to examination before the State board form the most interesting part, however, of the bill to the future veterinarian and to the existing places of education.

Section 176 of the bill reads:

"The regents shall admit to examination any candidate who is more than twenty-one years of age, of good moral *character, has the general education required in all cases after July 1, 1896, preliminary to receiving a degree in veterinary medicine not less than three full years*, and has received a degree as veterinarian from *some registered* veterinary school."

Those requirements read all that we have been asking for, in fact all that which imposes itself upon veterinarians and upon veterinary schools of repute that which must necessarily be carried out all through the country in a short time.

It means for us a perfect indorsement of our remarks and of our propositions made in Chicago before the members of the first veterinary congress of America held last year. It means all obligations for every one who shall intend to practice in *this state*, to obtain certificate of qualifications and of registration; it means no more imposition on the part of the easily obtained graduation from any school from any part of the world, it means death to quackery, it means the elevation of the veterinary profession on its proper pedestal.

And yet with all these great benefit obtained, with all these obligations which are going to make the veterinary profession of New York State what we are all wishing for; why do we have some objections to make?

The reason is simple, and though it may appear personal on

my part, I will not hesitate to mention it, feeling as I do, that no one here will accuse me of personal feeling when the subject of veterinary elevation is at stake.

Gentlemen, years ago, when I began the hard work of starting the first veterinary school opened in New York, I admitted to matriculation gentlemen who were earnest in their intentions, in their purposes, but whose education . . . Well, I will say nothing of this . . . some stayed with us, worked hard and succeeded; others, well they failed or retired to engage themselves in other more suitable business, and so it went until 1875.

I do not mean, however, to carry the impression that all the students at the New York school at that day were inferior in their education. Some of them have made their mark in the profession. Some of them are to-day among the foremost of our colleagues.

In 1875 the American Veterinary College opened its door, the matriculation requirements are carefully considered and imposed in 1877, when "*certificates of collegiate or academic education or a preliminary examination are demanded.*"

Of what did that preliminary examination consist of—it was not very severe you may believe—but yet it proved a benefit—better students came to us.

In 1885 the requirements at the American Veterinary College are made more stringent and better defined. "They demand a *good common school education, certified by college degree,* or an examination on *reading, writing and spelling.*"

In 1889 a still more severe test is demanded as the examination now will consist in "an *essay* as test of *handwriting, orthography, grammar and reading from a classical work.*"

In 1890 no change is made, but "the *better educated the candidate is, the better will it be for his further studies.*"

In 1894 the requirements are either a certificate or diploma of a college degree, or "certificate of an examination passed before a recognized college, or of having attended the highest class of a public school," or "an examination which will serve

as a test in *reading, handwriting, orthography, grammar and arithmetic.*"

Gentlemen, it has taken us twenty years to reach at this still low standard. We have progressed slowly, perhaps too slowly some will say. I will answer "yes, but surely."

It is well enough for some of our friends to say that the requirements demanded by the regents bill are certainly very low, and that after all, the examination on *arithmetic, elementary English, geography, spelling, United States history, English composition and physics* cannot be considered as two severe a test for a candidate to the study of the immense field of comparative medicine.

I will grant that "the better educated, the better fitted," but are our young men prepared for this sudden raise in the requirements. Many possess those qualifications no doubt, but how many do not. It may be proper to expect them from our city boys, but how about those who are in the country. It may not be difficult to find them among families well to do, but how about the ambitious boy, who has by hard work, I was almost going to say hard labor, learn some of the requirements that you ask, has economized to see his way through the three years of college life . . . and who finds the college doors closed for the present at least, for several years anyhow, until he becomes possessed of your new re-enforced obligations.

But let us suppose that we are in error—that the officers of the American Veterinary College have been wrong in working so carefully since their organization, and that the requirements of the bill of the regents should be the only one which would allow our veterinary schools to grant degrees to veterinarians who would establish themselves afterwards to the state. What would it mean? What would be the result?

Simply this: "*Private schools give up your charter and close your doors. Your existence of thirty years teaching, Gentlemen of the faculty, are no protection.* Your ungrateful work, your years of perseverant activity, your sacrifices in behalf and for love of your profession must all be ignored. *Your schools will remain*

empty, not because of your deficiency perhaps, but of the severe requirements for which our young men had no opportunity and no time to prepare and which *have chased them in the veterinary halls* of other states.

Do you believe, gentlemen, that I exaggerate. I have seen enough of this done in the past, and if it proves to be so when the requirements were so slowly, so gradually increased, what will it be when the new *regime* is re-enforced?

You may say that if the students from the state will go to graduate in other states, they will have at their return to submit to the requirements of the regents bill before they can practice.

This is true, but how do you know that they will return? and what will be said of New York, the "Excelsior" State, whose veterinarians would then become alumni from other schools, from graduates out of the State.

The Alumni Association of the American Veterinary College counts two hundred gentlemen out of her five hundred and thirty graduates, two hundred who are from New York State and New York City, and among which many are practicing in the state.

How many more hundred are likely to follow their example and yet, the life of our private schools, of those who were the nursery of the *American veterinary profession*, with their existence of hard and persistent devotion to her, a proud life as it is in fact, is threatened and her existence may be suddenly ended by a stroke of the pen of our Governor.

Gentlemen, no one in this building knows what the foundation and elevation of a place of instruction and specially of a veterinary school exacts of work, of restless nights, of patience, of sacrifices of all kinds. Some imagine that it is all smooth road, that all is needed is to organize, issue circular, open, go on . . . or close. But if any one entertains those ideas, let him be sure that it will take but a very short time to satisfy him of his error.

Our schools, as they have been since 1864, are private undertakings, their life, their improving curriculum, their success,

their existence have depended on the number of students which have come to them, they have not behind them the support of wealthy and well-known organizations—for these last one hundred students or no student, may seem alike—for the private schools, no student or a limited number mean an arrest in their work, a lack of life support, the closing of their doors.

And then what? Is our state prepared to receive the future students (from seventy-five to one hundred last year) who wait for admission to the school. Is there another veterinary institution which is ready to admit them, with the same facilities, same opportunities for theoretical or practical work.

If there is, then the regents are right. A school (I mean State school) with everything that is necessary, with perfect organization, is what is wanted in our large states. When once such State institutions exist, private undertakings will scarcely have right to existence, but until then, do not cripple the efforts of the schools of the day, which after all have done so well and against which you cannot even reproach their slow growth as long as you have not granted an *iota* to their help.

But here, Mr. President and gentlemen, I have occupied your attention quite long enough—I have endeavored to show you how a higher degree of education is necessary for our future candidates to veterinary degree, how with this desire in view the American Veterinary College has little by little reached the point where she is to-day; I have tried to show you what might, what will be the result of too sudden and severe requirements upon the existence of our private schools in the State, and which. in case of death, cannot be replaced *immediately*, and it is in the behalf and for the welfare of these mothers of American veterinary profession that I will close these remarks in recommending to the favorable consideration of the meeting the following conclusions, namely: That we endorse the passage of a bill recommending the establishment of a State Examining Veterinary Board, in *which* the requirements for matriculations to any of our State Veterinary Schools, besides those includiug degrees of academy, high school, etc., etc., shall be a certificate

from the Board of Registry of the University, based upon a graded scale in such a way that for the *year 1895–96* the examination shall be on *English composition* (that is spelling, writing, reading, *Arithmatic and United States Geography*; for the year *1896-97*, *English composition*, *arithmatic*, *geography*, and *United States History;* for the year *1897–98*, *English composition*, *arithmatic*, *geography*, *United States History*, *and elementary physics*, and in which the condition of admission to examination of a graduate before said board shall be a degree from a veterinary school or veterinary department of a University having at least a *three-years course* of studies and *college attendance.*

TUBERCULOSIS.

By Prof. E. P. Niles, D.V.S.

A paper read before the Virginia State Veterinary Medical Association.

(*Continued from page 600 and concluded.*)

All germs that cause disease do so by the poisonous products of their growth and multiplication within the system. In tuberculosis then, it is this chemical poison that causes the lesions, and the more rapidly this poison is formed the more marked will be the symptoms, and the sooner will the disease prove fatal. The system, as well as the milk of tuberculous animals, contains to a degree corresponding to the extent of the disease, a quantity of these toxalbumins, which when consumed with the flesh and the milk by tuberculous people, adds just so much more poison to the patient's system, thus converting what may be, in many instances, local tuberculosis, into a general form of the disease, and possibly cutting short the life of the individual a number of years. This theory is self evident when we stop to consider the manner in which Koch's lymph or tuberculin exerts its influence on tuberculous subjects when injected into the system.

The symptoms of tuberculosis are too well known to call for any discussion in this paper.

The treatment is of but little importance to us as veterinarians, as the only proper course to pursue is to destroy all animals as soon as found to be tuberculous. With the medical profession the matters must be viewed from a different standpoint, for in their patients treatment must be attempted.

Many remedies, both new and old, have been tried, but all have failed.

Dr. Yeo, of the King College, London, and others have great faith in the use of creosote by inhalation, and large doses by the rectum, claiming to have gotten good results when the treatment was applied in the early stages of the disease.

Drs. Bertin and Picq claim to have effected a cure in a limited number of cases by injecting goats milk when all classical treatment had failed. Prof. Liebreich, of Germany, claims to have successfuIly treated a few cases by the hypodermic use of cantharidate of potash.

Aristol in olive oil has been used hypodermically; its advocates claiming a certain degree of success. The so-called "Amic treatment," which at present is a secret, originated in Cincinnati, but from reports of local physicians has no curative effect. The *Modern Medicine and Bacteriological World* quotes an article from the *Pacific Record* in 1892, announcing a new chemical substance which Klebs prepares from Koch's tuberculin, and which he names tuberculocidin. It is nothing more nor less than tuberculin with its injurious elements eliminated, and at the same time retaining its curative properties. It causes no elevation of temperature when injected into the system. In fact it is claimed that large doses reduce the temperature Out of a number of human subjects treated, Klebs claims to have cured 18.6 %, improved 60 %, no improvement 18.6 %, deaths 2.6 %. This is really a very good record, but as no further announcements have been made we may reasonably suppose that further experiments with this substance have not proved satisfactory.

When Koch announced his discovery of tuberculin in 1890, we were for a time led to believe that a cure for tuberculosis was at last at hand. Disappointment, however, was the result. In

experiments conducted with this substance a marked elevation of temperature was noticed when it was injected into the system of tuberculous subjects. In healthy subjects no elevation of temperature was noticed. In view of this fact tuberculin has been extensively used since 1891 as a diagnostic agent in the lower animals. For this purpose its value cannot be over estimated. The manner in which it acts as a diagnostic agent is an interesting one and demands a few moments of our time.

I have stated before that the system of tuberculous patients is charged with the toxalbumins of the germ of the disease. This product of the germ is nothing more nor less than tuberculin. The addition of a small amount of artificially prepared tuberculin to that already contained in the system causes a temporary fever, or reaction, in from six to twelve hours after the injection. The reaction varies from one to six degrees above the average normal temperature, and lasts from twelve to fourteen hours. In healthy subjects the quantity of tuberculin injected is so small that the animal is not affected by it. Reports are unanimous in support of this statement.

That this new method of detecting the disease in all of its stages is an extremely delicate and accurate one will be seen by the following experiments :

In April, 1893, tuberculin was used on the entire herd of cattle at the Experiment Station, with the result that only one animal gave the reaction. This animal was a thoroughbred Shorthorn cow in excellent flesh for beef, for which she would have been sold in another week, as she was worthless as a dairy cow. The elevation of temperature above the normal was 1.8°. A post-mortem examination revealed intestinal tuberculosis, with two large tubercles on the liver. In July, of the same year, by the request of Captain C. E. Vawter, of the Miller School, and with the assistance of Prof. Tinsley, I used tuberculin on the entire herd of milch cows belonging to the above mentioned school with the result that one cow gave a reaction of 4.2°. An autopsy in this case revealed intestinal and pulmonary tubercu-

losis. This cow was a high grade Jersey, and was in good milking condition, showing no outward signs of the disease. After the test was made on the college cattle a "scrub" milch cow was purchased and allowed to run with the other cattle on the farm. During the latter part of winter this cow suddenly died of acute tubercular pleuritis and pericarditis. To ascertain the result of bringing this diseased animal to a healthy herd, the tuberculin test was repeated on the entire herd of seventy-two head of cattle last June, with the result that six animals gave the reaction as follows :

Thoroughbred Holstein cow, three years old, reaction 2°.
Native cow, three years old, reaction 1.1°.
Thoroughbred Jersey cow, five years old, reaction 1.2°.
Thoroughbred Holstein bull, three years old, reaction 2.4°.
Thoroughbred Guernsey heifer, two years old, reaction 1°.
Thoroughbred Jersey bull calf, reaction 1.1°.

At this time the general condition of all of these cattle was good with the exception of the Holstein cow and bull. The bull had frequent attacks of diarrhœa and would not fatten with the best of care. The cow had recently calved and had not done well since.

As the reaction in all of these animals (except the bull, which had an abnormally low temperature before injection,) was slight, and all but one were thoroughbreds, it was thought best to separate them from the herd and make a second test. It may be stated in this connection that the temperatures of these animals, both before and after injection, were submitted to Dr. Salmon, of the Bureau of Animal Industry, and that he reported none at all suspicious except the Holstein bull. The animals were kept separate, however, and tested the second time a month later, with the result that the Holstein bull was the only one that gave any trace of a reaction ; the elevation of temperature in his case being 1.3°. As a result of this test the animals were allowed to mingle with the balance of the herd until June 15th, when my attention was called to the Jersey cow

which had, since the test, lost flesh rapidly and developed an aggravating cough. Suspecting tuberculosis, she was at once destroyed and an autopsy held which revealed pulmonary and intestinal tuberculosis with enlargement of the lymphatic glands of the mesentary. In fact this was one of the worst cases of tuberculosis that I have had an opportunity to examine after death.

On June 22d, the bull and native cow which showed a reaction of only 1.1° on the first test, and none on the second, were also destroyed. The autopsy on both of these animals revealed intestinal tuberculosis with enlargement of the internal lymphatics. The three remaining animals have not yet been slaughtered, but are isolated and will be tested with tuberculin later in the fall, and if they show the slightest reaction they will be slaughtered at that time.

The question as to what elevation of temperature constitutes a reaction is at the present time an open one. I have seen no cases reported where the animal was condemned with a reaction of only one degree unless the general symptoms were prominent enough to make a diagnosis possible by a physical examination.

Dr. Conrow, in a communication to the *Veterinary Magazine*, January, 1894, reports the destruction of one case that showed the physical signs of tuberculosis, and with tuberculin gave a reaction of 1.4°, but upon holding a post-mortem no tubercles were found. Dr. Conrow does not state whether or not a careful examination of the bones and *all* other tissues of the body was made. If such an examination had been made it is more than probable that tuberculosis in some one of its many hiding places would have been found.

From my own experience I am led to believe that any elevation of temperature, that continues over two or more readings, above the highest normal variation during a period of twelve hours before injection is diagnostic of tuberculosis, and that if we expect to completely eradicate the disease from our herds we must take this as a standard. It would be much more profitable

to occasionally destroy a healthy animal than to let one that is diseased escape, even though we expect to repeat the test in six months time.

The following conclusions may be drawn from the various reports on the use of tuberculin:

First.—That tuberculin is of no value as a curative agent; since in both man and beast, whether injected hypodermically or taken into the system with tuberculous milk and meat, it converts latent into acute tuberculosis.

Second.—That as a diagnostic agent in the lower animals it is exceedingly delicate and almost invariably accurate in the hands of experts.

Third.—That the method of its use as published by the Bureau of Animal Industry is more accurate than any other method yet in use.

Fourth.—That the system acquires a certain tolerance to the action of tuberculin after the first injection; thereby making a second test unreliable without the intervention of several months.

The laws necessary to control the disease in the lower animals and lessen the mortality in man may be briefly stated as follows:

First.—The most important of all, the establishment of a state board of health, one member of which shall be a qualified veterinarian.

Second.—The appointment of a qualified state veterinarian, who shall be an *ex-officio* member of the state board of health, and work under its direction.

Third.—A liberal appropriation placed at the disposal of these officers in order that they may effectually carry out their work.

Fourth.—The establishment of public abattoirs, and compelling the slaughter of all animals for meat at these places.

Fifth.—Providing for veterinary inspection of all animals slaughtered for meat. Also veterinary inspection of all public dairies.

Sixth.—The provision of some means to compensate owners of all condemned animals.

Seventh.—A law empowering the state veterinarian to order the destruction of all condemned animals.

Eighth.—The provision of county hospitals for indigent tuberculous people.

Ninth.—Compulsory disinfection of all premises that have been occupied by tuberculous people or animals.

Tenth.—Compelling the disposal of the carcasses of all tuberculous animals by cremation.

Eleventh.—Prohibiting tuberculous people from attending public gatherings in closed buildings.

Twelfth.—Prohibiting the inter-marriage of tuberculous people.

With these laws in force tuberculosis can be pratically stamped out.

Science is arrayed for the battle; all that is lacking is the declaration of war on the parts of the states and government.

THE INFLUENCE OF CLIMATE AND OTHER ENVIRONMENTS ON THE DISTRIBUTION AND CHARACTER OF DISEASE.

By Prof. W. L. Williams, V.S., Montana.

A paper read before the United States Veterinary Medical Association.

(*Continued from page 617.—Concluded.*)

Its distribution among horses in enzoötic form so far as we can learn, appears to coincide geographically with actinomycosis of cattle, a fact to which Dr. Reynolds has already drawn attention. A relationship has been suggested on account of their like distribution.

They bear other minor resemblances at times, and we occasionally see in poll-evil or fistulous withers large indurated swellings with small oft-recurring abscesses, pursuing a very chronic persistent course.

In cases there appear, too, a well marked tendency to disease of osseus tissue, not typical of ordinary caries. In two cases without symptoms of caries I have seen in cases of poll-evil antero-posterior perforation of occipital protuberance with discharge of pus from the poll-evil escaping through this bony channel on the forehead.

On the whole, poll-evil and fistulous withers in enzoötic form like actinomycosis seem to be diseases of prairie localities and do not affect timbered regions. Of all states east of the Mississippi River, Illinois, the chief prairie state, seems the only one in which the prevalence of this disease cannot be accounted for satisfactorily on the traumatism theory. Dr. J. S. Butler, of Minneapolis, draws attention to a notable fact that in his region—as is the case in Illinois—the disease is rare in cities in comparison to the number of cases occurring on farms. Were traumatisms the sole cause such should not be the case.

While many veterinarians of the west and northwest adhere to the general view that this disease has its sole cause in traumatism, they admit its much greater prevalence and enzoötic character, and quite a number in whose views I concur fully are thoroughly convinced that traumatisms do not cause a large percentage of the cases seen in the area where the disease is most common. Among these are Drs. Dinwiddie, Arkansas; Lemay, Kansas; Stewart, Kansas, and T. J. Turner, Missouri.

Periodic or Specific Opthalmia offers some very interesting facts in its geographical distribution. It seems common in the British Islands and continental Europe although not so prevalent as in parts of the United States. In our country the disease occurs frequently in the New England and Atlantic States, due largely to importation from the Mississippi Valley. It appears to arise frequently in the Allegheny Mountains, and is reported common in Maine by Dr. Choate, and in Massachusetts by Dr. Paige.

Along the coast it seems to disappear almost wholly, except as an imported disease, so Drs. Pearson, Peters, Kilbourne and

others report it very rare, although other practitioners report a more frequent occurrence.

In Alabama, Dr. Cary reports the affection frequent and acute, but in general the disease seems not very common in the South.

The disease occurs most frequently in the states bordering upon the Ohio River and upon the Mississippi River above its junction with the Ohio, reaching its greatest prevalence in the United States and probably in the world in Illinois, Iowa and Missouri. In more northerly states it tends to disappear so that Dr. Lyford, of Minneapolis, sees it largely in imported horses.

As the high semi-arid country east of the Rocky Mountains is approached, the disease becomes far more rare and less dangerous, yielding readily in most cases to care and treatment. So in Nebraska and North Dakota, Drs. Stewart and Hinebauch report it very rare and mild.

Reaching a still greater altitude with less rainfall and humidity the disease vanishes as we approach the Rocky Mountains to reappear again at a few of the lower altitudes along the Pacific Coast.

This disease has no known parallel in geographical distribution. It vanishes wholly in those regions where tuberculosis and tetanus cease to exist but prevails to its greatest extent in regions where the latter are comparatively rare, and in turn it becomes rare where tuberculosis and tetanus prevail most frequently and severely.

The etiology has been explained by some teachers and writers apparently to their entire satisfaction. I was taught that it was largely hereditary and that the shining example of this was to be found in the progeny of the famous blind sire Lexington, and so in my early practice I frequently found the cause in a remote infusion of Lexington blood, attributing to other causes, the more frequent appearance of the disease in draft stock, not related to Lexington. In the Rocky Mountain region we find as much of the Lexington blood comparatively as anywhere, the original breeding stock having been derived very largely

from Kentucky, and bands of thoroughbreds are found, almost any animal of which, may be traced back to the illustrious blind horse, yet I have not seen a horse in the Rocky Mountains affected with periodic opthalmia except newly imported animals and these recover promptly unless very far advanced and remain permanently free from the disease. My observations in this region have been brief and limited, but are in full accord with the more extensive experience of Drs. Knowles, Montana; Waugh, California, Arizona, New Mexico and old Mexico; Turner, Fort Niobrara, Neb., and other veterinarians and stock owners of this region. In fact I have been unable to learn of a single case of this disease arising in the entire Rocky Mountain region, whereas were heredity a sufficient etiological factor in the causation of the disease in this entire region, where carelessness in breeding reaches its highest point, should be thoroughly over-run with this affection.

Inbreeding is mentioned too as a fertile cause, yet in the large bands of wild horses in this region colts grow up in the bands, are left uncastrated and mate promiscuously with parent or offspring without producing evil results in this respect.

Close ill-ventilated stables, especially dark stables, are also cited as fruitful causes, but in the northern Rocky Mountains, where low temperatures prevail, stables are very dark and unsanitary, yet the few horses kept in them are free from the disease.

Others attribute the disease to the ill-effects of bright sunlight, especially to snow-glare in the winter season, but this disease is more of a summer affection, and does not occur so largely in winter in any district so far as observed, and were snow-glare an important factor the Rocky Mountains should be the chief habitude of this disease, since the snow-glare of this region is far beyond that of the states where the disease prevails.

No one living in the Mississippi valley or eastward can begin to appreciate the intensity of the snow-glare as seen at high altitude in the Rocky Mountains, with its dry, calm atmosphere and excessively low temperature during winter.

Others attribute the disease to food, and since it reaches its highest prevalence in the chief corn-producing states, maize is largely held responsible for its prevalence. There is good reason for believing this food to be an important factor in its cause, but not in itself sufficient to bring it about, or at least it falls far short of being a chief or essential cause.

The disease is not uncommon in many regions in this country where corn is rarely fed, and appears frequently in England and continental Europe where corn is not fed at all.

Neither is corn fed along the low Pacific Coast, where the disease prevails. It is hard to determine under these conditions if food can ever suffice to produce the disease, or if the great prevalence of the disease in the chief maize territory is a mere coincident.

That temperature and more especially altitude and humidity exert a powerful influence upon the occurrence of this disease there can be no doubt.

Dr. Clements, Baltimore, Md., suggests yet another element in the causation of this disease worthy of careful consideration, and in order that I may give you his views clearly, I quote his words. "There is an affection from casual observation identical with specific ophthalmia, but which is infectious beyond doubt, and which attacks horses without history of what we call specific ophthlmia—sudden attack of conjunctivitis, followed in a few hours with acute iritis and pus in the anterior chamber. Disease amenable to treatment by rest, counter-irritation and atropia injections. If not attended to, apt to be followed by adhesion of iris to lens and sometimes cataract. Either this is different from specific ophthalmia, or we are all wrong in description of latter disease—I am inclined to latter belief."

Dr. T. J. Turner, Missouri, gives a description of the disease essentially identical with that quoted from Dr. Clement, and I have noted in several cases in Illinois the same symptoms, course and termination. I would add also that on several occasions on farms where the disease had not before occurred, and in families where prior history had been wholly clean in respect to this dis-

ease and where the most careful examination failed to discover any cause in or even change of food, housing or care in any way whatever, that the disease would suddenly appear in several animals in a very virulent form, running an exceedingly acute course, terminating frequently in blindness at the first attack. In this way I have seen four or five animals out of a band of seven or eight horses on one farm all previously sound and without hereditary taint, suddenly attacked with vurilent, ophthalmia ending in permanent blindness, the disease then vanishing, leaving the sound animals perfectly well. In these cases all parts of the eye appear inflamed, tense and painful, the conjunctivæ hyperæmic, the cornea opaque and the anterior chamber filled with lymph, pus or blood. Dr. Clement's suggestion of infection in these cases is certainly worthy of careful consideration, as it may possibly explain them, which cannot be satisfactorily done by the theories advanced heretofore.

To say the least, our accepted ideas as to the etiology of periodic opthalmia need revision.

NEW REMEDIES IN VETERINARY MEDICINE.

By T. W. Turner, D.V.S., New York City, N. Y.

A paper read before the Veterinary Medical Association of the County of New York

Since December last, when I had the honor of reading before the German Veterinary Medical Association of New York and Vicinity a paper on "New Remedies," published at the time in the *Journal of Comparative Medicine*, the busy world of science has not been at a standstill, for its motto is that of the celebrated Galileo—*E pur si muove*—(and still it moves) and is constantly plunging forward into the larger spaces of light and knowledge. And though not many new therapeutical agents have been added to the actual list, our laboratories are filled with the hopes and promises of the future, and the anticipations of another year will be doubtless realized in the discovery of some new and valuable dditions to our pharmacopœia, that will go far towards assuag-

ing the many ills to which animal flesh is heir. In consequence of the intense activity which has characterized the lines of inquiry in this domain, and the many tests to which new combinations must be subjected, as far as their full therapeutical value can be established, the student is compelled to move slowly and insist rather on fullness of detail than multiplicity of outlines, and hence we must confine ourselves to the considerations of but a few remedies at a time.

Acetanilide.—Prepared by a prolonged interaction of pure aniline and glacial acetic acid at a high temperature. It is one of the most simple synthetical compounds of the "new remedy" era. When pure it forms lustrous rhombic tables, colorless and odorless, with a peculiar greasy feel and slight burning taste. It requires 200 parts of cold, 18 parts of hot water, and 31½ parts of alcohol to make a neutral solution. Under the copyrighted name of antifebrin, acetanilide was introduced into medicine in 1887 as an antipyretic. Its principal employment has been in the treatment of neuralgia and rheumatism. As an antipyretic in phthisis and other pulmonary affections, in typhus and fevers generally it has been largely replaced by remedies of more recent date. The dose of pure acetanilide is from one to three drachms for a horse. Owing to its cheapness it is used extensively in veterinary medicine, and no ill after-effects have been noticed in its employment an an antipyretic. For external application it is not to be recommended.

Antikamnia is a preparation which was introduced by an American firm as a substitute for morphine, and as an antipyretic and analgesic. It is manufactured as a fine white powder, and gives evidence of its non-homogeneity when examined under the microscope. Several analyses of antikamnia have been published. They all agree in finding the chief constituents to be acetanilide with bi-carbonate of soda, some also discovered caffeine, tartaric acid and other ingredients.

Antipyrine.—Although a very widely known remedy, and also a fairly staple body, it may not be known that it is more or less decomposed or thrown out of solutions, by a number of

other chemical compounds, a fact which is of considerable importance to bear in mind in dealing with mixtures of which it forms an ingredient. From the long list of drugs and preparations found to be incompatible with antipyrine, the following are the most important: Tannic and hydrocynic acid, chloral, tincture, decoction and extract of cinchona bark, all iron salts in solution, bi-carbonate of soda, salicylate of soda, tinctures containing tannin, iron or quinine, and tincture of iodine. It may be mentioned that the latest observations as to the action of antipyrine have led to the expression of the opinion by several authorities that it has a marked, and in some instances, a dangerous action on the heart, producing lowering of blood pressure, malaise and collapse. To the utterance of warnings to this effect must be ascribed the fact that antipyrine, which was almost used as a specific against influenza during the earlier epidemics, was almost abandoned during the later ones. Against the copious perspirations which frequently accompany the action of antipyrine, either atropia or belladonna are given with advantage, either together with the remedy or shortly before.

Paraldehyde.—A product of the condensation of three molecules of ordinary ethyl aldehyde. Paraldehyde was introduced into medicine about 1884, as a hypnotic and sedative. Physiologically it is characterized by the absence of action on the heart. It has a strong reducing effect upon the blood, like all the aldehydes, and this influence precedes the narcotic action. Paraldehyde was specially recommended as a substitute for chloral where this remedy was contraindicated or did not produce satisfactory results. It is a clear, colorless liquid, having a characteristic ethereal odor, and a burning and afterwards refrigerant taste. Soluble in water 1 to 10. The dose for a horse is one to two fluid ounces. It may also be used subcutaneously, but there is seldom need to resort to this mode of administration, as it is promptly absorbed from the stomach.

Phenacetine.—A crystalline compound closely allied in chemical constitution to acetanilide and methacetine. It is prepared

by the action of ethyl-iodide on sodium paranitrophenol, which forms nitrophenetol, the latter yields by prolonged boiling with glacial acetic acid-phenacetine. It is described as appearing colorless, tasteless, inodorous, scaly glistening crystals, sparingly soluble in cold, more freely in boiling water, and in about 1 to 16 of alcohol. Phenacetine was introduced in 1887, and was recommended as an antefebrile, since which time its literature has attained large dimensions. It has been given in phthisis, typhus, polyarthritis; peritonitis with success, and has also made a reputation as an antineuralgic in vasomotor neurosis in the lancinating pains of neuralgia and hemicrania. Success followed its use in the whooping cough of children and in epidemic influenza both as a prophylectic and remedy. The action of phenacetine seems to be free from the danger of producing collapse and unpleasant effects generally; like most of the synthetical antipyretics its antefebrile effects are accompanied by more or less profuse perspiration. When fever is accompanied by restlessness or sleeplessness, phenacetine has been found to reduce the high temperature and produce quiet sleep without being followed by headache.

The soluble forms of iron.—The use of iron in medicine dates from the earliest times; indeed, so remote is the period when man first began to appreciate its virtues as a medicine that it is no longer possible to exactly define it. Probably the first form in which it was taken was not as a metal or as salts, but in some mineral spring which bubbled up from an unseen source richly stocked with super-carbonate of iron dissolved from some ferruginous strata through which the water passed. What may be distinctly termed the scientific use of iron in the treatment of disease, dated from the discovery of that element as a constant constituent of healthy blood, the conclusion being inevitable that it served some important purpose there, and that, consequently, its diminution might be the cause of disease. So it came about that iron grew to be regarded as a hæmatic, or as a medicament that specially acted upon and enriched the blood. All conditions of the body which were characterised by an ap-

parent poorness of the vital fluid were looked upon as calling for the administration of iron. The intelligent employment of the metal advanced another step when it was discovered in the domain of physiology, that the activity of the blood corpuscles as oxygen-carriers was dependent upon the presence of iron. It was found that the formation of new blood was also closely associated with the presence of this metal, so far at least as the abundance of red corpuscles was concerned, and that, what may be called the repair of the blood after severe hæmorrhage, was greatly facilitated by supplying an abundance of iron. A secondary question was naturally thus: In what form ought iron to be administered? It forms two classes of salts, distinguished in earlier times as per- and proto-salts, and to-day by the adjectives ferric and ferrous. The various oxides, ferrous, ferric and ferrous-ferric played an important part, their activity being, of course, due to the solution of some proportion of the dose administered in the acid juices of the stomach. In later times various ferric and ferrous salts, oxides and hydrates, were used in medicine, as well as the metal itself in the finely-divided state known as reduced iron. There were, however, a number of disadvantages associated with their prolonged administration, as was found to be the case in certain anæmic and chlorotic conditions. Among the soluble forms of iron the dialysed solution of the oxychloride was free from many unpleasant properties of most ferric preparations, but then its therapeutical activity was largely questioned by those who, regarding gastric absorption as partly dependent on a process of osmosis, asked how any liquid could be absorbed from which every constituent has been removed which was affected by the laws of osmosis. A more intimate study of the chemistry of the blood indicated that its contained iron was in the form of organic compounds of great complexity, and the idea suggested itself that it would be more rational to administer the remedy already in combination with some readily decomposable organic acidulous radical, than as an inorganic and very stable salts, which must be split up in the organism before the natural compound can be formed. As

a consequence, there originated such preparations as, the malate, citrate and lactate of iron. Most of these combinations are markedly less astringent than the inorganic salts, more pleasant to take, and presumably more readily borne and assimilated by the digestive organs. Even these preparations, though very great improvements on the earlier soluble forms of iron, did not come up to the requirements of a progressive therapy, and experiments were continuously being carried on with the view of discovering combinations of iron which, without possessing any of the disagreeable properties of the older galenicals, should exceed them in therapeutical activity and usefulness. The first step toward achieving this object, in the direction of preparing what may be termed natural compounds of iron was taken in 1877—by preparing a soluble albuminate of iron, *i. e.*, decomposing a clear solution of albumen with ferric sulphate, a precipitate was obtained which, freshly prepared, dissolved in a slight excess of caustic alkali. The solution, however, was possible only when a certain proportion was maintained between the iron salt and albumen. When such a clear alkaline solution was dialysed, sulphuric acid and excess of alkali were entirely removed, and the solution was unaffected in its medicinal virtues by the addition of alkali, alcohol or excess of acid. As this preparation and the iron salts generally are very largely prescribed for anæmia and other consequencea of a deficient nutrient supply, it may be interesting to inquire a little more into the nature of the morbid condition. Besides ordinary anæmia or chlorosis, there is a distinct variety of idiopathic anæmia, the essential pathological feature of which is a destruction of blood, and the most constant anatomical sign of which is the presence of an excess of iron in the liver, where the seat of the disintegration of blood corpuscles is in the portal circulation, and the destruction is believed to be affected by certain poisonous agents, probably of ptomainic nature, absorbed from the intestinal tract. The action of iron under these conditions has been closely investigated by numbers of physiologists and pathologists. Some have believed that the number of corpuscles increased under the

chalybeate treatment, while others have maintained that a very important factor in the beneficial result was an improvement in the quality of the corpuscles, that is in their richness in hæmoglobin, with little effect upon the number, which sometimes actually diminished. Later observation has shown that the effect produced depends mainly upon the different dosage of iron employed.

THE VALUE OF PROPHILACTIC TREATMENT IN ANTHRAX.

By John Faust, V.S., Poughkeepsie, N. Y.

For twenty-nine years, to my personal knowledge, splenic apoplexia and splenic fever have occurred every year up to 1886, in a streak of swampy land about two miles long, and Mr. Noxon, one of the sufferers, says he lost $30,000 worth of cattle in that period. All imaginable diseases were suspected by professionals and non-professionals. I held post-mortems year after year, and always found one and the same thing—splenic fever or apoplexia.

In the year 1885, the suspicion of poisoning was so strong that Mr. Noxon wanted a chemical analysis made of the stomach. As I know that would have been money spent for nothing, I proposed that Professor Liautard make a post-mortem examination. After the post-mortem he stated to the owner that the whole cause was splenic fever.

A great many medicines were used with no effect. I advocated to the owners the vaccination with anthrax virus. I even went so far as to offer to do it for nothing if it was a failure.

The following is a history of the different herds that came under my care in 1886:

On July 3d, was called to see a cow belonging to Mr. Hoppe; she died before I reached her. The second cow was found dead in the lot. On July 10th was called to the third cow and put her under treatment for splenic fever (my record does not show what treatment). In twelve hours to all appearances she was well, but in ten hours more she died and post-mortem examin-

ation proved it to be splenic fever. The spleen weighed eight and one half pounds.

Mr. Hoppe's neighbor also lost his only cow. They were the only cows those men owned.

On July 17th, I was called to Mr. E. Lyon's farm. Ten days previous to my call, he lost one Jersey cow. On July 16th, the second cow was taken sick to which Dr. Thompson was called and diagnosed it as dysentery. The cow died shortly after he left. On July 17th, two more cows died without warning or medical care. The same day I found nine sick cows. My diagnosis was splenic fever. I was not prepared for any treatment that night. On the 18th, I made a post-mortem on cows that died on the 17th, and found them to have had typical cases of splenic fever. I then separated the sick from the well.

The following is the symptoms and treatment of this herd:

RECORD.

July 18th, 10:30 A. M.. No. 1, temperature 107°, very restless all night.
" " " " " 2, " 108°.
" " " " " 3, " 106°.
" " " " " 4, " 103½°, restless. Died at 5 P.M.
" " " " " 5, " 107½°.
" " " " " 6, " 101¾", sinking. Died at 7 P.M.
" " " " " 7, " 105¾", breathing very hard.
" " " " " 8, " 108°.
" " " " " 9, " 104½°.

The treatment in all these cases was fluid extract eucalyptus glob, ½ ounce doses, and arsenicum album 1-100 3 drachm doses, alternating every two hours.

July 19th, 10:30 A. M., No. 1, temperature 104¾°, restless all night.
" " " " " 2, " 106½°.
" " " " " 3, " 103°.
" " " " " 5, " 106⅓°.
" " " " " 7, " 102", breathing almost normal.
" " " " " 8, " 105°.
" " " " " 9, " 101⅓°.

The same treatment continued, they all eat, drink and ruminated some.

July 20th, 12 M., No. 1, temperature 101°, very little restlessness.
" " " " 2, " 102½°, very drowsy and stiff.
" " " " 3, " 101°.
" " " " 5, " 102⅓°.
" " " " 7, " 101¼°, breathing normal.
" " " " 8, " 100¾°.
" " " " 9, " 101°.

Continued same treatment every three hours.

July 31st, 3:30 P.M. Temperature of all the cows was normal. They all eat and drink well and have a fair flow of milk. No medicine.

On July 25th, I inoculated nine cows and one calf with Chauvean's virus received from Professor Liautard. The following is the method of vaccination.

Clip the hair on inside of thin part of the ear. Make a small incision with a sharp-pointed bistoury. Clean off the small quantity of blood and inject with hypodermic syringe two drops of the virus.

On July 26th, cow No 3, had a very alarming high temperature: At 11:30 A.M., temperature 107°, and at 7 P.M., temperature 108°. All the rest of the cows had a slight rise in temperature. On July 27th, cow No. 3's temperature was 102½°, and to all appearances well.

The ears of all the cows, where the inoculation was made, swelled to more or less extent.

The following is a history of the herd of cattle owned by the Hudson River State Hospital. On the 27th of March, 1887, I was called to make post-mortem examination on a young cow which had died the night previous. *Results:* On removing skin, the tissues appeared to be filled with dark hœmorrhagic spots, the spleen very much enlarged, and of a very dark color; the abdomen contained a quantity of dark serum; the kidneys were dark and ecchymosed. The statement was made by Dr. Cleveland that they had lost from ten to twelve head every year at different periods in the same manner for a number of years.

I proposed the vaccination of the entire herd with Chauveau's virus, to which the doctors of the hospital agreed, on the 31st day of March I vaccinated the entire herd of forty-four head.

The following is the table of temperatures after vaccination:

No.	Temperature before Injection.	Temperature after Injection.					
	Mar. 31.	Apr. 1.	Apr. 2.	Apr. 3.	Apr. 4.	Apr. 5.	
1	102	102	103	102	101½	101	
2	100	102¼	102	101½	102	100¾	
3	100	101½	103¼	102	101½	101	
4	100½	101	102	102	101	100½	
5	100½	105½	104	103	102½	100	
6	100¾	102¼	103	104½	102½	101	
7	100	102	102¾	104½	105	101¾	
8	100	101	101	101	102	101	
9	100	101	102½	101½	101	101	
10	100	101¼	102½	102	100¾	100	
11	99½	100¾	102	101¼	101	101	
12	100	101½	103¼	103½	102	101½	
13	100½	102	102	101¼	101¼	101	
14	100	100¾	102	101	101	100½	
15	100¼	102¼	104	103	101½	101	
16	101	102	102½	101	101	101½	
17	100½	102	104	100¾	100¼	100	
18	100¾	102	104¾	101¼	101	101	
19	100	101¾	105	107	104½	101	Ear swollen very badly.
20	101	102	102¼	101¼	99¾	100	
21	100	101¾	102½	100¼	100¾	100	
22	101	103	104	103	101	101	
23	100¼	102	102½	99½	100½ Chill.	100	
24	100	100¼	102	99¼	105	101	
25	100	102½	103	100¼	100	100½	
26	100½	102¼	103	101¼	100½	100	
27	101	103¾	103¼	103	100¼	101	
28	100½	101	102	101¼	101	101	
29	99¼	101½	102	100	101	100½	
30	100	101	102	101½	99½	100	
31	100	101½	102	101¼	101¼	101	
32	100½	102¼	102	100	101	100½	
33	100	103¾	102	103	102½	100¾	
34	101½	103	100¾	102	103	101	
35	100¼	102¾	102	101	100	100¼	
36	100	102½	103	100½	100½	100½	
37	100¾	103	102	101	100	100½	
38	101	102½	104	102½	101	100	
39	101¼	103	102½	101	101½	101	
40	100½	103	101¾	100	101	101½	
41	101½	104	102	101	100½	100¾	
42	101	103	102½	101¾	100¾	101	
43	100	103½	105	103	101½	100¼	
44	100½	102	104	102	100¾	100½	

Of these vaccinated, two died after a lapse of four years and four months of splenic apoplexia, fortunately in a place where no cattle have been kept since.

I also vaccinated the herd of Mrs. Wiley, consisting of thirty-three head, and Mr. J. Rose's herd of sixteen head. There was no table of temperatures kept of these two herds.

Since 1887, there has been but two cases of splenic apoplexia (the two of the Hudson River State Hospital) in the whole district.

Every year for over thirty years this disease has claimed its victims.

This is certainly very gratifying for the use of prophylactic treatment of this disease.

SOME EXPERIMENTAL RESEARCHES ON THE USE OF MALLEINE.

By PROF. A. LIAUTARD, M.D., V.M.

A paper presented to the Congress of Hygiene at Buda-Pest.

MR. PRESIDENT.—When several weeks ago, you did me the honor to ask me to present before the Congress in Buda-Pest some remarks upon the use of malleine in the diagnosis of glanders, I understood that your principal desire was to obtain documents upon the uses and results obtained by those among us, American practitioners, who, acquainted with all that has been written and said, proved and discussed in Europe, would have by special observations obtained facts which might throw some light on the numerous questions yet in doubt.

It is with that object in view that I send you these few pages, which, though concise, may, I hope, find near you as well much indulgence as I desire them to be interesting.

The great discovery of our Russian colleagues was known in America in 1892 by a few among us, and at the annual anniversary meeting of the United States Veterinary Medical Asso-

ciation, Prof. F. L. Kilborne, of Washington, D. C., called the attention of the Society to the report of numerous experiments which had been made by him under the direction of the Bureau of Animal Industry at Washington, a complete rendering of which was published in extenso in the AMERICAN VETERINARY REVIEW, vol. 16, page 437 and followings.

It was to be hoped that the publicity given to the report of Prof. Kilborne would have for its result the awakening among our confreres of America of a great desire to use malleine. The results obtained by him at the experimental station had been so much in accord with those published in European journals, the advantages that one might derive from its uses were so manifest, the facility with which it could be obtained (the Bureau of Animal Industry having offered to deliver it free of charge to all applicants), all these reasons were more than sufficient to justify the belief that many among us would in the future consider malleine as a weapon, indispensable to the armory of the veterinarian. But, must I acknowledge it! I believe there is nothing of the kind—and, with few exceptions, malleine has not yet entered into the practical domaine of our veterinary medicine—differing much in that respect from tuberculine, which, from the fact of the enormous quantity of tuberculous cows found in our private dairies, has been in such demand for the last few months.

In making such a statement, I must say that I believe myself justified, because, having in hand a quantity of imported malleine, and having offered it gratuitously to my confreres here, my offer remained entirely ignored ; and, again, because our veterinary journals have contained but very little report on the subject which would be of any value, and if there are records made they may be published in those of the Bureau of Animal Industry, of which I am not aware. *

With this brief history relating to the use of malleine in the

* Since this was written, an article by Prof. Harger, of Philadelphia, was published in the *Veterinary Magazine*.

United States, I found myself much embarrassed as to how and where to find the material necessary to my paper. To keep my engagement, however, I beg to ask your permission to present you with the history of several cases which are personal to myself and the medical staff of the American Veterinary Hospital and to offer you the conclusions I derived from them.

Among the questions that may be presented upon the use of malleine, taking in consideration all that has been written on the subject, and carefully weighing the successes and the failures obtained with it, and also the new questions and problems yet unsolved which have been brought forward of late, and especially in France after the experiments of Montoire, and in the discussion before the Societe Centrale de Medecine Veterinaire of Paris, among all these questions we believe that the following are the most important:

1st. What is the action of malleine when injected in healthy animals, in decided glanderous or suspected animals, or in those affected with other diseases?

2d. Is malleine infallible when used in doubtful or suspicious animals?

3d. Does malleine possess curative properties?

4th. Several samples of malleine being given (American, German and French), which seemed to keep its qualities the longest time?

5th. At what hour after the injection is the reaction the most marked?

A glance thrown upon the tables adjoining the observations that I have made and recorded, will, I hope, be a sufficient explanation of the conclusions to which those experiments have brought me, and with which I will try to bring my mite in the solutions of the problems which are still obscure.

1. (*a.*) *Malleine upon healthy animals.*—Our observations upon the effects of malleine injected into animals in perfect health do not differ from those obtained by our European confreres. Used by us as experiments, the results have always been the same—no elevation of temperature, no general consti-

tutional changes; in other words, no local or general reaction.

(*b.*) *Malleine upon diseased individuals, but not glanderous or suspicious.*—I have injected malleine into animals affected with diseases entirely different from that for which it is indicated, and with what result? In almost all, the same upon which Prof. Nocard has so well called the attention of the veterinary world, viz., a negative result, without any reaction. It is thus that in a case of suppuration of the sinuses, with necrosis of the palate (obs. 3), in a case of chronic suppurative synovitis of the hock (obs. 6); one of maxillary adenitis with lymphangitis of the face (obs. 12), a cold abscess of the shoulder with suppurative synovitis (obs. 18), and in a case of extensive suppurative lymphangitis of the left hind leg (obs. 32), in these five cases there has not been any general reaction nor any rise in the temperature. If in Observation 32 there has been some general reaction, it has been so irregular and so analogous to that existing during the whole sickness, that it can scarcely be considered as pathognomonic and belonging to the effect of malleine.

There are, however, two cases which are of some importance, I believe, because they may have a tendency to prove that, after all, malleine might react in other diseases besides glanders.

Observation 8 was obtained upon an animal which was to be used for dissections, and upon which there was no indication of glanders. He received malleine,—he reacted,—and at the post-mortem the only lesions found was a small pulmonary abscess of the size of a large apple upon the anterior lobe of each lung; of glanders, nothing.

Observation 35, made upon a horse condemned on account of a suppurative pneumonia of fifteen days' existence, in showing an elevation of temperature of 2 4-5° F., joints the preceeding as an exception to the rule.

From these two observations, and the fact that malleine is also so demonstrative in cases of pulmonary glanders, is it

improper to suspect a certain coincidence tending to show that malleine has a certain power in all affections whose principal seat is the respiratory apparatus, the lungs ?

(c) Malleine in glanderous, suspicious or doubtful animals.—The action of malleine in all the cases where we have used it, either in those of a positive nature and of easy and sure diagnosis, or, on the contrary, in those that could be classified among the suspicious or the doubtful, has always answered to us in an affirmitive manner, allowing us in our observations to recognize some 50% among the animals experimented upon and which, without the test, would have been returned to their work to continue their nefarious work, instead of going to the knacker's yard, where they belonged.

2. *Is Malleine always Infallible?*—Sinceour reading of all the experiments and records of malleine, since we had become familiarized with the published results, and especially since the day we experimented ourselves, we were pleased to consider in malleine a weapon sure and positive, which had been given to us to assist in the diagnosis of a doubtful and uncertain animal. The history of observation 33 came, however,, to destroy, partly, for a certain time, our belief. This horse, whose symptoms had all the time been almost without importance in the point of view of glanders, though they were not altogether ignored, came and offered us a reaction of 3 3-5°F in temperature, and besides local effects of little doubtful nature. But from that moment, the symptoms which were somewhat suspicious began to improve and then disappeared. A second injection was then made ten days later; the reaction was not entirely positive, but remained doubtful. A third injection, a week later, a fourth three weeks after, remained negative. The horse is apparently in perfect health, and whether Malleine has not told the truth, or

3. *Has she brought on the recovery of pulmonary glanders, yet in its incipient stage?*—Whatever it may be, the horse has returned to his work, which is not light, as he belongs to a traveling circus and is still in perfect health. Was his case similiar to those mentioned by Prof. Nocard in his answer to the

critics of Mr. Leblanc? I regret that I did not destroy him, as I would have done with the permission of the owner. Perhaps I would have found at the post-mortem another solution to this important problem. However, this question of the possible curability of glanders by malleic effects is not so new; what is missing is the evidence that can only be obtained by observation and the autopsies of reputed recovered animals carefully traced afterwards in their existence.

4. *Malleine*, being a peculiar preparation from the culture of the virus of glanders, like turberculine and pneumo-basilline, are obtained from the cultures of the tuberculous and peripneumonic viruses, *must have the same qualities*, in whatever aspect it is found. And whether as brute malleine of Roux, it is syrupous in aspect, of a dark-brown color, or like that of the Bureau of animal industry, it is delivered in solution, and then appears more aquous and of a lighter dark coloration; or, again, that it be like the one of Mr. J. Trautweiler, veterinarian, of Newark, who gave me two samples of German malleine, both of a very pale citrine color and almost like water (those are the three preparations that I experimented with), no matter what the physical character may be, the reactive effects must be the same.

That the injection be made with 1, 2½, or 5 cubic centimeters, according to the indications of those who have prepared it, no matter; the reaction will always appear to tell the story, and, if the effects are absent, when the malleine has been used in a case of glanders, is it not because the malleine has lost its qualities? Therefore, the quality of the malleine is of a certain importance, and its age must not be neglected no more than its physical qualities.

Let us see. In August, 1892, I received from the laboratory of Dr. Roux, some brute malleine, and began to use it. I had been informed then that probably after two months it would have lost its properties. Observations 1, 2, 3, 4, 5, 6, 7, 8, 14, were the results obtained with it—used in solution, 2½ c.c. at a dose. Observation 14 is made with it in April, 1893—that is eight

months after its arrival in this country.* In Observation 20 the malleine does not seem so pure, there is a slight deposit. I use it. however, in confirmation of an experiment made with German malleine. and of this Roux malleine I inject 15 drops brute, not diluted. The result of this experiment was an elevation of temperature almost equivalent to that obtained with the German malleine. *A year had elapsed since I received it*, and its properties were the same.

I made with German malleine; with Dr. Trautweiler, several observations. For some are injected 2½, for others 5 c.c. My colleague knew nothing of these samples, of their preparations, or of their strength; he had received them from Germany, I believe, and we used them.

It is thus, that in Observations 16, 19, 20, 21, 22 and 23 we injected 2½ c.c., and in Observations 17, 18, 24, 5 c.c. The results presented nothing particular. As I write this report, it is a year since I received that malleine, and it has yet the same aspect—clear, slightly citrine, and limpid. Has it the same qualities? I propose to test it at the earliest opportunity.

The malleine that I have obtained from the Bureau of animal industry at Washington has been tested in Observations 9, 10, 11, 12, 13, 23, 24, 25, 26, 27, 28, 29, 30. Like the precedings, this preparation has given me excellent results. The last sample I received December 10, 1893; on January 22, 1894, it had lost its limpidity; had become thick. That was probaby due to the mode of preparation, another sample received the same day is yet clear and possesses the same qualities.

However, without being desirous to decide in favor of Roux malleine and grant it a superiority to that of other origin, I think in all justice I must acknowledge that its satisfaction and the results obtained by its use induce me to have a certain preference for it.

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* Since this paper was written we have learned that the malleine prepared by Dr. Roux and Prof. Nocard can be kept for any infinite length of time, under special condition, and that it remain always the same.

50. It being atmitted that malleine in cases of glanders gives rise to an elevation of temperature, an interesting and even important question is to know *after what lapse of time, at what hour does this elevation manifest itself?* It is a question important to the practical point of view. As it is necessary to the observation to properly register the temperature at a certain hour, is there a time, a given moment, when the changes in the temperature will begin to be manifested.

In the *Clinica Vétérinaria* of June, 1894, appeared an article showing that this has been the subject of numerous observations. Allow me to add some data obtained from my personal observations. They are resumed as follows: In one case the rise in temperature was noticed on the 4th hour after the injection of malleine, in four after the 10th, in one after the 11th, in five after the 12th, in one after the 13th, in nine after the 14th —in one single case it only began towards the 24th, and reached its maximum towards the 35th hour.

All these observations give an average of the time of the highest temperature between the 10th and the 14th hour, beginning before the 10th and extending to the 14th.

From these it seems to me that the regulation of the temperature is much simplified. The injéction being made in the evening, say between 10 and 11 o'clock, the first temperature being registered in the following morning, say from 7 to 8 A. M., will allow us to follow the rising of the thermometer every two hours until the expiration of the 16th hour, say until 2 o'clock in the afternoon, which is generally the beginning of the dropping of the temperature.

In conclusion, allow me to call your attention upon a peculiar point presented by observation 29. This horse, certainly glanderous by a first injection of malleine given on the 12th of April, received on May the 17th 2½ cubic centimeters of Roux tuberculine, and twelve hours later gave a reaction of more than 4 degrees, with manifestations of local reaction such as malleine had never given before.

Nocard tells us that "Tuberculine remains without effect on

glanderous horses." In this observation the reaction with tuberculine was far superior to two injections of malleine of different origin, and the post-mortem confirmed their effects by the presence of extensive lesions of glanders in the lungs.

Such, gentlemen, is the result of my observations with malleine; they are very incomplete, it is true, but, nevertheless, I hope that they may prove for you of some interest, and that they may be of some value. Since the first days when it was admitted in the domain of veterinary pathology I have closely watched the literature on the subject, and patiently followed the numerous writings published upon it, I have experimented in the limit of my professional resources, and as much as I could, and it is with faith in the results obtained that, with Mr. Nocard, I can say that I have the strong conviction that, as in Europe, a day will come when malleine shall be admitted in the daily practice of the veterinarians of the new World as it has with our collegues of Europe, and that here, as over there, it will render such services and be of such value that no veterinarian will remain indifferent to its use.

(To be Continued.)

REPORTS OF CASES.

A COMPLICATED CASE—DISTOKIA—CALCULUS OF THE RUMEN.

By G. T. Goubeaud, D.V.S., Brooklyn, N. Y.

The following is the report of a rather unique case which occurred during the course of the writer's practice. I have never heard or read of one like it, and therefore think it of interest to the members of the veterinary profession. I will relate an incident in the same case which may throw some light upon the succeeding condition of the patient. On the 16th of June I was called to see a case of difficult parturition in a valuable Jersey cow, the property of Mr. L., living in one of the suburbs of the city. He had attempted to deliver her himself and failed, saying the head was turned and that he could not straighten it. He

also stated that she was in labor for about ten hours. I called and found the presentation almost as he had described it to me. The neck was flexed downward and backward between the fore legs in the direction of the fœtus. The chin touched the floor of the fœtal abdomen. The owner had tried to deliver the fœtus in this position, as he had already failed in trying to obtain the normal presentation. The fœtus was wedged into the pelvic cavity so tightly and so firmly that it seemed an utter impossibility to force the fœtus back. With extreme force the fœtus was at last forced back and the normal position obtained, after which parturition took place with but little difficulty. Being fatigued I did not remove the placenta, and I told the owner not to interfere with it, as it would pass in a short time. He called on the third day afterward and said the placenta was as he termed it, rotten. He said he became anxious after I had left, because in two hours the placenta was not expelled, and he had given her in all ʒi of Extract Ergot Fl. I called and found the exposed portion of placenta undergoing putrafactive changes. After considerable labor the os was dilated and the placenta removed. The patient would not eat and appeared weak and exhausted. I left instructions as to injecting antiseptics into uterus, as a foul odor eminated from the vagina, also gave instructions as to feeding with gruel, milk, eggs and whiskey. I left and heard no more of her until the 28th of August, when the owner came into my office and rather surprised me by saying that his cow had a hole in her belly on left side and that food was coming out of it and dropping on the ground. Had noticed for a week or so a slight swelling on side with black spot in centre, but on account of its trifling appearance paid no attention to it. I called that afternoon and found her in a recumbent position, lying on her left side and ruminating. The owner called her, she assumed the standing position, walked over to him and ate an apple out of his hand.

Following is the History.—Patient was sickly after I removed placenta, would not eat or drink, had to be fed on gruel, eggs and milk for two weeks afterward, after which she began to

thrive, and has done well up to time of present trouble. On morning of day I saw her she milked eight quarts. The regular yield was about twenty-two quarts Temperature 101°, respiration 20°, pulse 50. She looked the picture of health. Upon the left hypochondriacal region, low down there was a slight elevation of skin becoming more elevated towards the centre, about six inches in width. Except towards the centre it was firm, hard, unyielding and fibrous-like. The skin and underlying structures seemed to be intimately adhered to each other. In the centre of this elevation there was a patch of skin denude of hair, about three inches in width, having almost the exact appearance of a sitfast, which is so common upon the backs of horses; dry, leathery-like centre; black, gradually shading towards the edges to a dark brown purple and greenish tints of a slightly gangrenous odor. This discolored skin was detached from the normal skin for about an inch and a half, this left an opening through which escaped fluid—solid food, both of which had the characteristic odor of the contents of the normal rumen. After removing the detached portion of the slough, about two quarts of liquid and solid food escaped. I now introduced my two fingers into the opening and found a hard, solid, firm, unyielding fibrous-like ring almost circular, about an inch and a half thick. I now removed a small stone and about a tablespoonful of sand or clay. I forced my fingers up a little further and could feel the mucus membrane lining the rumen and some food. After dislodging the food and withdrawing my fingers, about two quarts of fluid escaped through the opening. I introduced my fingers again and felt what I supposed to be and afterwards found to be two small fibrous bands around the circular opening, uniting the rumen to the floor of the abdomen, forming a true gastric fistula. Not wishing to force the whole of my hand into the opening for fear of doing damage, I removed whatever particles of food I could with my fingers. After washing the opening and surrounding parts antiseptically, I attempted to close the opening up. The patient was cast and turned on her back. I now removed the entire slough and surrounding un-

healthy skin. For the suture I used six strands of the strongest waxed silk I had; the interrupted sutures was used. In some places it was utterly impossible to force the needle through. It was necessary to cut holes with a fine pointed bistoury. After the opening had been sutured the animal was allowed to assume the standing position, which she did after making several uneffectual efforts. From the struggling to stand up in the hay and also in trying to assume the standing position, it caused all but three of the sutures to either break or pull through. I naturally felt disappointed at this mishap, but more so, for as the animal walked a few steps a small portion of the rumen and a loop of intestine passed through the opening. I cast the animal again and used the quill sutures. I forced back the protruding portion of the rumen and loop of intestine. The rumen and floor of the abdomen were sutured separately, as nearly all of the adhesions were now broken. I sutured the rumen with the cat-gut sutures; the uninterrupted suture was used. I am afraid the suturing of the rumen was more in name than reality, as it was fast becoming dark and I could hardly see. After suturing the abdominal walls as firmly and as securely as I possibly could, the animal was allowed to stand. Each abdominal suture was from two to three inches from the edges of the wound. A smaller suture was used to bring the edges of the wound together, thus making it almost impossible for the abdominal sutures to break. The wound was dressed with carbolic, a large pad of oakum applied over it and the abdomen enveloped tightly in a hand circular bandage. The patient was rather irritable and restless, so I gave her ʒiv of Tinct. Opii. I stood her in a small stall, giving her as little freedom as possible, after which I left. She was seen the next afternoon. The bandage was soaked by the discharge; the oakum was saturated with it, as was also the surrounding skin. It possessed quite a characteristic gangrenous odor. The discharge had a sero-sanguinous color and oozed from the edges of the wound and from the holes caused by the suture. Skin looked black and blue in patches and small septic abscesses were beginning to form. The sutures were beginning

to pull through, six or seven had already pulled through. The wound in general looked extremely unhealthy; animal irritable, restless and anxious-looking. Temperature 105°, respirations 38°, pulse 80. A very unfavorable prognosis was now given and the owner advised to destroy the animal, to which he unwillingly consented.

Post-mortem.—It was becoming dark as I began the post-mortem. The character of the abdominal opening has already been described, so I will not repeat it. It had a general gangrenous appearance. The abdominal opening was torn through in places. On the floor of the abdomen, surrounding the opening, were fibrous bands uniting it with the rumen. The majority of these were now broken, which no doubt was done by the animal struggling to stand and from the forced position it was compelled to assume. The peritoneum was also adhered to rumen and floor of abdomen. These adhesions were not numerous nor well marked, except towards the opening. The rumen had a hole in it corresponding to the abdominal opening, but much larger and had healed over to nearly same size of abdominal opening. The rumen surrounding the opening seemed to be congested and had gangrenous spots on it. It was now quite dark, so much so that it was impossible to see what any of the viscera looked like. I sewed up the wound that I had made and left to call next morning to make a thorough post-mortem, but had the œdema buried.

GLANDERS—MALLEINE.

By J. S. LAMKIN, D.V.S., Yonkers, N. Y.

The following, as my first trial in the use of this valuable ingredient, may prove interesting to my colleagues and induce them to employ it oftener:

The horse had been working on a grocer's wagon for six weeks previous to my attention being called to it and mingling with his five other horses. He was considered to have a "catarrhal trouble," in fact, a certificate to that effect by a veterin-

arian in New York accompanied the animal at time of purchase. There had been during this time quite a copious discharge of offensive mucopurulent matter generally, when most abundant, of a light yellow color and only slightly viscid. Both submaxillary glands somewhat enlarged and tender; no cough at any time and only one slight hæmorrhage from the nostrils; animal strong, hearty, and doing his work well. Temperature for a day previous to the inoculation stood at about 100 1–2°. The malleine was introduced into the side of the neck at 10.30 P. M. The following morning there was general uneasiness, lack of apppetite and anxiety, along with a working of the jaws and lips, as if the mouth and throat were dry. Temperature at 7 A. M. 103 1-2. The local inflammation was considerable, a swelling having formed at point of inoculation of the size of a man's fist, which grew during the day to the size of a goose egg, and extended up and down the side of the neck some few inches. The temperature rose to 104 1-5° at 9.30 A. M., reacting 105 at 2 P. M. when I ceased taking it. The animal was permitted to live for two days longer when I destroyed him and made a hurried examination of the head and lungs. Although no ulcers could at any time be seen through the nostrils, previous to the inoculation small ones were *beginning* to form low enough down to be seen at time of death, and the whole general glanderous condition of the animal appeared to have been much aggravated by the introduction of the malleine. The turbinated bones, rather the mucous membrane covering them, was black and covered with ulcers, and the upper portion of the nasal septum also contained a number. Throughout the lungs were hard nodules with occasionally one breaking down or caseated. I much regretted having to stop here, but I had no more time to spare.

BIBLIOGRAPHY.

Advanced Agriculture. By Henry J. Webb, Ph.D., B.Sc. Longmans, Green & Co., London and New York.

Works of this nature are not common in English literature, and when one is offered presenting, as "Advanced Agriculture" does, material of interest for veterinarians, it must be received by them with pleasure and read with interest. The days are fast going away when, especially in America, the education of veterinary students was satisfied to have in the curriculum of his alma mater merely lectures on the various principal branches of veterinary medicine. They now look for something else; they began to appreciate the link which united them to agricultural knowledge, and if they do not expect to obtain it as extensively as the students of agricultural colleges do, they need some of it. Their education of veterinarians obliges them to know something of the general principles of agriculture.

Truly it is, perhaps, more to the students of agricultural colleges that the book of Dr. Webb is intended for, but part first, on "Agricultural Science" proper, and certainly part second, on "Agricultural Practice," present to the veterinarians subjects of great interest.

In this last part, Chapter vii, treats of live stock; it gives the breeds of horses, of cattle, of sheep, of swine, and even of poultry and fowls, etc.; the management of these animals; some interesting points in relation to their breeding, general cares, etc., all of which, occupying some 200 pages of the book, are presented to the reader in a manner which cannot but prove most beneficial.

The rapid examination that we have made of "Advanced Agriculture," reminds us very much of similar works on the same subjects, which we have read in French, such as the works of Magne and of Sanson.

We can well commend it to those who are interested on the subject and certainly to the veterinarians.

Every Man his own Horse Doctor. By George Armatage, M.R.C.V.S. (fifth edition). Frederick Warne & Co., London and New York.

We have on previous occasions noticed works from the same

author and have credited him for their value. To-day our attention is called to this new book, the fifth edition of a previous one, which was issued nearly twenty years ago, in 1879.

This edition is far ahead of those which successfully have been presented to the public in 1885, 1889 and 1892, it is considerably enlarged, is illustrated by steelplates and numerous cuts of value, and contains as complete a description of the diseases of horses, with indications of treatment, as can be expected in a work of this kind. It is not, properly speaking, a work of classical value, nor one which can be considered as the book for veterinary students, and yet they, or even the old practitioners, will find in it many points of interest and of value.

To the ordinary reader, to the private horse owner, Mr. G. Armatage has presented an excellent work; by its perusal they will obtain a great deal of good information, and we believe, lots of good advice, and yet, valuable as *every man his own horse doctor* may be; popular as its reading may prove, we cannot help but think that we have found more professional value in other works which it has been our privilege to read from the same author.

The entire subject of equine pathology is divided into ten principal sections; the eleventh and twelfth which follow treat more of surgical affections and operations. Section thirteenth speaks of poisons, while section fourteenth forms a dispensatory semi-therapeutic and materia medica. A brief dictionary or glossary completes the 858 pages of the work, which is handsomely gotten up, well printed and easily read.

Manual of Veterinary Microbiology. By Prof. Mosselman and Liénaux; translated and edited by Prof. R. R. Dinwiddie, of the Arkansas Agricultural Experiment Station. Robert Clarke Co., Cincinnati, O.

Prof. R. R. Dinwiddie has done a service to the veterinary profession in translating Mosselman and Liénaux's *Manual of Veterinary Microbiology* into the English language, and thus made this valuable work accessible to those not conversant with

French. It is a fairly complete resumé of our knowledge on the subject, with especial attention to the pathogenic varieties that now occupy so large and increasing a share of medical attention. In most works on bacteriology, the microbiology of animal diseases is relegated to a subordinate position, the maladies which affect human beings being necessarily of primary importance. The reverse is here the case, and those concerned in the treatment of animal diseases, the book fills an entirely unoccupied place.

The first portion is devoted to general considerations of the morphology and physiology of microbes. The second portion treats of the pathogenic microbes, their transformation and destruction, and their relation to hygiene and therapeutics. The third and last portion considers the microbic diseases individually, and the latest methods of combating them.

The book is not intended to be a laboratory manual, and consequently the technique of staining and cultivation of germs is not exhaustively treated. An increase in the number of illustrations would have been an advantage; more especially as the veterinarian rarely gets the opportunity to familiarize himself practically with these organisms. We can heartily recommend the work to our readers.—W. GOTTHEIL.

Investigations Concerning Bovine Tuberculosis, with special reference to diagnosis and prevention. Conducted under the direction of Dr. E. Salmon, Bureau of Animal Industry. Bulletin No. 7.

This is a large pamphlet of some 180 pages with illustrations containing the report of the investigations made by Drs. Theobald Smith, F. L. Kilborne and E. C. Schroeder concerning the diagnosis and prevention of tuberculosis, to which is added the results of tests made in the use of tuberculin by Dr. E. A. de Schweinitz.

At this time when tuberculosis occupies so much of the public and scientific attention, these reports will prove very interesting and of great value, especially when they are the results of

the work done by authors already known by their previous investigations in similar directions.

The pamphlet can be considered as divided in five parts. In the first are presented clinical and pathological notes on a herd of sixty cattle tested with tuberculine; in the second are experimental observations on the presence of tubercle bacilli in the milk of cows. The third and fourth contains studies in bovine tuberculosis, with special reference to prevention and practical suggestions for the suppression and prevention of the disease. The fifth by Dr. E. A. de Schweinitz treats of tuberculine and its use.

The six illustrations are not made up in the style that we have been accustomed to find in similar works from the bureau, but are still good suggestions of the lesions they are intended to represent.

Production du Lait. (The milk production) by Ch. Cornevin.

This little volume is one of the publications of the *Scientific Encyclopædia* published under the direction of Mr. Leanté of the Institute, and is due to the pen of the well-known Professor of the Veterinary School of Lyons. It is divided in three parts, each of which contains several chapters, where the milk and its secreting sources with the etiology of the qualitative and quantitative changes are considered; then follows the points of selection of good milch cows, either as breeds or individuals, concluded in the third chapter on the subject of exploitation of milching cows principally in the point of view of hygiene.

The origin of the book speaks sufficiently of its value.

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VETERINARY LEGISLATION.

AN ACT to establish "The State Live Stock Sanitary Commission" and to provide for the control and suppression of tuberculosis and other dangerous diseases of domestic animals in Pennsylvania.

SECTION 1.—Be it enacted, etc., that a commission is hereby established to be known as "The State Live Stock Sanitary Commission." This commission shall consist of five commissioners to be appointed by the governor as follows: The Secretary of the State Board of Agriculture, a practical breeder of live stock, the Secretary of the State Board of Health, and two competent and qualified veterinarians who are members in good standing in any legally chartered Veterinary Medical Association of this State who are graduates in good standing of some recognized and reputable veterinary college. Each commissioner shall be appointed for a period of four (4) years, and shall be subject to removal by the governor for incompetency or neglect of duty.

SEC. 2.—It shall be the duty of the commission to protect the health of the domestic animals of the state, to determine and employ the most efficient and practical means for the suppression, control or eradication of dangerous, contagious or infectious diseases among the domestic animals, and especially of tuberculosis, and for these purposes it is hereby authorized and empowered to establish, maintain, enforce and regulate such quarantine and other measures relating to the movements and care of animals and their products, the disinfection of suspected localites and the destruction of animals as it may deem necessary to prevent the spread and transmission of contagious or infectious diseases.

SEC. 3.—Whenever it shall be adjudged necessary to the interests of the live stock industry of this state or to the welfare of the public to kill an animal or animals suffering from some contagious or infectious disease and an agreement cannot be made with the owner or owners thereof as to their value; three appraisers shall be appointed, one by the owner or owners of the cattle, one by the commission or commissioner and a third by these two, who shall under oath or affirmation appraise the animal or animals at their actual value at the time of the appraisment and the owner shall be paid one half of the appraisement, provided that no such appraisement shall exceed fifty dollars for single unregistered cattle or seventy dollars for single registered cattle or forty dollars for a glandered horse or mule, and further provided that no animal or animals found to be infected with a contagious or infectious disease within ninety days after having been brought from another state into Pennsylvania, shall be paid for, but notwithstanding, the commission shall be authorized to slaughter such animal or animals if in their judgment such a course is necessary to the interests of the live stock industry or to the welfare of the public. and provided that in case it shall be found upon making the autopsy of an animal appraised and killed by order of the commission or of a commissioner that such animal was not at the time of slaughter suffering from the contagious or infectious diseases supposed to have been present, the entire appraised value shall be paid to the owner or owners.

SEC. 4.—The commission or any commissioner or any of their duly authorized agents shall at all times have the right to enter any premises, farms, fields, pens, buildings, cars or vessels where any domestic animal is at any time quartered, or whereever the carcass of one may be, for the purpose of examining it in any way that may be deemed necessary to determine whether they are or were the subjects of any contagious or infectious disease.

SEC. 5.—Any person or persons wilfully violating any of the provisions of this act or any of the regulations of the "Live Stock Sanitary Commission" or wilfully interfering with officers appointed under this act, shall be deemed guilty of misdemeanor and shall upon conviction be punished by a fine not exceeding $100, or by imprisonment not exceeding one month or both at the discretion of the court.

SEC. 6.—The commission is hereby empowered to employ such assistants and agents and to purchase such supplies and materials as may be necessary in carrying out the provisions of this act, and to administer oaths or affirmation to the appraisers appointed under this act.

SEC. 7.—The salaries of the commissioners shall be fixed each year by the governor.

SEC. 8.—For the purposes of this act the sum of $500 annually is hereby appropriated.

SEC. 9.—This act shall go into effect July 1, 1895, and all acts or parts of acts inconsistent herewith are hereby repealed.

CORRESPONDENCE.

VETERINARY EDUCATION.

Editor AMERICAN VETERINARY REVIEW:

SIR:—In the last issue of THE REVIEW Dr. D. A. Cormack, of the South Dakota Agricultural Experiment Station, attempts to criticise my articles on education, published in the issues of July and August. It appears to me that the doctor feels himself hurt, for which I am sorry. For while I earnestly believe the time has come for a uniformly higher veterinary education in America, I, like Dr. Cormack, "want to see the change brought about with as little friction as possible." Truth hits hard; but it is sincere and honest, and there is no meanness about it.

While this may explain my feelings in the matter, I can see no reason, on the other hand, why I should apologize for anything I have said, if it is construed in the proper light. When, therefore, Dr. Cormack says that I made a "wholesale onslaught

upon the bulk of graduates from the two-year schools," he construes wrong. In the first part of my article I said: "One or two of the old two-term schools have done good work in years gone by and actually fulfilled a mission; they have sent out a sort of rough-and-tumble practitioner, but a man with a ready practical judgment and eminently fitted for the peculiar needs of the country in times past. Some of these men, by their perseverance, honest principles and constant self-education had met with wonderful success." This utterance is certainly no onslaught, but. if anything, is a compliment. I maintained, however, that some of our two-term schools have turned out during the last few years hundreds of men who are utterly unfit for the profession from a moral and scientific standpoint, and who cannot but disgrace the profession. If Dr. Cormack would have ever met these men as I have, he would certainly agree with me that they are "the modern quacks." The old quack was known to have no college education and was largely excused for his misdoings on account of this. But when a man spreads out a great, big diploma and then turns out to be of low character and of little better professional education, if any, than the old empiric; then the intelligent public gets rightly disgusted, and they turn away with contempt from the veterinary profession, whereas the money-making diploma-mills should be blamed, for they should not accept such men as students.

Another fact will illustrate that same right in urging a higher education: Dr. Salmon states at the last meeting of the U. S. V. M. A. that of the thirty veterinarians who took the examination for meat inspectors under the Civil Service rules, only *two* passed, and *those two were foreigners*. Will you please reflect, Dr. Cormack?

Apparently Dr. Cormack is a little behind the times if he includes Montreal and the New York Schools into the two-term schools. Montreal has been a three-years school as I know of it, and has turned out some very clever veterinarians. Both the New York schools have adopted a three-year course, and have now more students than ever before.

There is a strong probability that not many of the two-term schools will be left before long. They have ceased to pay and that settles it with most of them. One such school has just closed its doors, another had a row between professors and students, and the latter have applied for admission at another college. The remainder of the two-term schools, I am glad to say, are willing to change under certain conditions. The Kansas City Veterinary College is willing to make hers a three-year school if the Chicago Veterinary College does so; and this latter college is willing to change if the Toronto school leads. Several graduates of this school have sent me an invitation to be present at a meeting in Canada for the purpose to request "the control of the Ontario Veterinary College by the Government, the raising of the college standard, and to exclude illiterate persons from the ranks of the profession."

All this indicates that the ball has been set rolling, and I am so glad about these indications that I shall only urge these to "go on." I hope they will come out of this change a better, a nobler set of schools, and I rely for this upon the words of the great poet, "that the whirling of time brings round redress."

OLOF SCHWARZKOPF.

TRAUMATIC PERICARDITIS IN THE XVII. CENTURY.

WOODBURY, N. J., Dec. 4, 1894.

Editor AMERICAN VETERINARY REVIEW:

DEAR SIR:—The subjoined extract will probably be of interest. In the fourth volume of the Diary and Correspondence of Saml. Pepys, Secretary to the Admiralty, in the reign of Charles II. and James II., are some letters on the subject of "Second Sight"; in one of these Lord Tarbat, speaking of "Elf Arrows" (evidently arrow-heads of the old or new stone age), states that the country people (Scotch) believe that the elves shoot them into the hearts of cattle, and "Lord Tarbat, or some other lord, did produce one of these elf-arrows which one of his tenants or neighbors took out of the heart of one of his cattle."

Truly, T. B. ROGERS, D.V. S.

VETERINARY EDUCATION.

Editor AMERICAN VETERINARY REVIEW:

DEAR DOCTOR:—Having noticed several articles on the subject of better education for the veterinary surgeon, especially at matriculation, I enclose you copy of letter received by us, which you can use or destroy,* as you see fit, not in any way intending to reflect on the college named, but simply to ask: What examination did this young man pass?

Yours,

W. G———.

" April, 6. 94.

" SIR.—I would like to *practis unde* you the following " *Sumer* have had one *years practis* tended college last year & " part of this at the —— Veterinay college in ——. Will help " you for Board & Room —. for Reference Addres Prof. —— " *Veterinay* College.

" Yours truly"

ANSWER TO CALIFORNIA QUACKERY.

SACRAMENTO, Cal., November 22, 1894.

Editor AMERICAN VETERINARY REVIEW:

SIR:—We would respectfully crave your permission to reply to a long-eared demonstration published in the last issue of THE VETERINARY REVIEW, under the heading, "An Eastern Veterinarian's Estimation of California Quackery."

The article referred to does the profession in this State a rank injustice, and it would lead us to believe that the author's deportment during the time he was located in California, was such that his associates consisted largely of quacks and charlatans; it would also lead us to believe that he was grossly ignorant of the workings of the California State law which regulates the practice of veterinary medicine and surgery. If this

* We thought better to publish it.

person was capable of interpreting the law aright, he would know that the law does not apply to men practicing in towns which have less than two thousand inhabitants, neither does it apply to castraters. Even in towns which have less than two thousand inhabitants the law has accomplished wonders towards the eradication of the quack. This is mainly due to the fact that imposters located in small towns are situated in the same boat as the person who wrote the article referred to above, in California parlance, they do not "savee" the law, as they believe it applies to the State as a whole.

That the law, such as it is, is vastly superior to any and all laws enacted by Eastern States, is a fact well known to all who have inquired into its workings. It does not, as most State laws in the East, allow a man who can make an affidavit that he has drenched a domesticated animal once or twice during the three or five years previous to the passage of such an act, but it requires all non-graduates practicing in cities and towns of two thousand inhabitants or over, to pass a practical examination before a board of examiners, who have full power to grant licences to any and all who can satisfy them as to their competency to practice veterinary medicine and surgery,

That the board has been lenient in some respects we do not deny, but if we understand the objects of the law correctly, its objects are not to work a hardship on the deserving empiric, but rather to stamp out an element composed of quacks and fakirs. This we believe it has done to a considerable extent, and as a result we can truthfully say that the veterinary profession in this State has gained more social and professional prestige in the past two years than it has in any other State in the Union in the same length of time.

It does seem to us, Mr. Editor, that some people will never attain the great art of attending strictly to their own business. Some people's minds are so disposed that it is impossible for them to avoid villifying any measure adopted by members of their own profession, rather than crediting them for what they have accomplished, and refraining from exposing to the public

eye their possible shortcomings and blunders. Even if the Board of Examiners have allowed their sympathies to gain control of their better judgment, which we doubt, it is the duty of every veterinarian, in justice to himself and his profession, to hide the fact from the gaze of those whose evil dispositions keep them constantly on the alert for a fitting or unfitting opportunity to throw some mud in vindication of their professional jealousy.

You yourself, Mr. Editor, must realize the advancement of the profession in this State, at least it is only a short time ago since we noticed a complimentary remark in your journal, and we do not know that we can leave the matter in better hands than yours to decide whether the article in question was a gross fabrication emanating from the mind of one who is unable to realize that there are some men who are devoted to their profession as a matter of principle and professional pride, or whether it was an arraignment for the purpose of satiating an ever-existing morbid appetite born of a jealous and abject disposition.

Respectfully,

R. A. ARCHIBALD, V.S.

SOCIETY MEETINGS.

MISSOURI STATE VETERINARY MEDICAL ASSOCIATION.

The third annual meeting of the Missouri State Veterinary Medical Association was held at Merchants' Hotel, St. Louis, Mo., on October 12, 1894.

Dr. T. B. Howard, President of Navada, Mo., in the chair, morning session.

There were present Drs. T. B. Howard, Navada, Mo., T. F. Arnoid, Lewiston, Mo., L. M. Rlutz, Clinton, Mo., T. L. Wolf, Kansas City, Mo., J. B. Black, Kansas City, Mo.

The minutes of previous meeting read and approved.

The following named gentlemen presented themselves for membership and were elected: Drs. A. Rouif, J. M. Philips, A. E. Philips, M. M. M. McNelly, E. N. Farrell, of St. Louis, Mo.,

L. F. Booth, of Moberley, T. J. Turner, State Veterinarian, of Columbia, T. F. Kierman, Jefferson City, T. E. White, of Sedalia, Mo.

Dr. M. R. Trumbower, State Veterinarian, of Illinois, was elected an honorary member. Meeting adjourned until 2 P. M.

Meeting again called to order at 2 P. M. Dr. Arnold read an interesting paper on "Actinomycosis," and handled the subject very intelligently,

Dr. L. M Klutz then followed with a paper entitled "Veterinary Science," which was also very interesting.

Dr. M. R. Trumbower then kindly entertained the meeting with a description of the new laws of Illinois relating to contagious diseases, etc.

The following names were presented and duly elected as members: Drs. R. J. Sollberger, C. W. Crowley, B. F. James, A. J. Hamerstein, H. B. Piatt and Chas. Ellis, all of St. Louis, Mo.

Dr. M. H. Schelle, M. D., was elected an honorary member.

Election of officers being next in order the following named gentlemen were duly elected and installed: Dr. T. J. Turner, State Veterinarian, of Columbia, Mo., President; Dr. T, F. Arnold, of Lewiston, Vice-president; Dr. F. L. DeWolf, of Kansas City, Mo., Treasurer, and H. B. Piatt, of St. Louis, Mo., Secretary.

No further business, the meeting adjourned to meet at Moberly, Mo., on the first Wednesday in September, 1895.

H. B. PLATT, *Sec.*

TWELFTH ANNUAL MEETING OF THE ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

SHERMAN HOUSE, Chicago, November 26–27, '94.

The meeting was called to order at 2.00 P. M., November 26th, by the president.

The roll being called the following members responded to their names:

Drs. A. C. Alverson, A. H. Baker, F. L. Brown, A. Babb, L. Campbell, V. E. Frizzel, J. T. Hattress, C. E. Sayre, John Scott, R. W. Story, F. S. Schoenleber, A. M. Story, M R. Trumbower, J. H. Ullrich, J. L. Tyler, M. Wilson, R. G. Walker.

The minutes of the last regular meetings were read and approved.

The president's annual address was then listened to.

The treasurer being absent from last regular meeting was unable to make a complete report.

The reports of the standing committees were received and the committees discharged.

Drs. Cunning and Newby being absent, but having sent their papers,* they were read by the secretary.

Dr. R. W. Story was then called upon for his paper on "Acute Indigestion."

The usual lengthy discussion of the disease followed.

The meeting adjourned until November 27th, at 10.00 A. M.

November 27th.—Upon reconvening, the president called upon Dr. H. R. Trumbower, the State Veterinarian who spoke on "Actinomycosis," and the methods pursued in the inspection of meats at the Chicago Yards.

This was followed by many remarks from the members on the methods that ought to be pursued in the inspection of meats in the country, for local consumption, also on the dangers arising from the use of flesh and milk from diseased animals for human consumption.

Dr. Tyler was then called upon for his paper on "Omphalo Phlœbitis."

The meeting then adjourned until 2.00 P. M.

Upon reconvening, Dr. C. E. Sayre was called upon for his paper on "Homœopathy in Veterinary Practice."

This paper brought forth quite an animated discussion, but was ably defended by Dr. Sayre from his standpoint.

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* These papers will be published in our next issue.

Dr. S. S. Baker then read his paper on "Remarkable Cases in Practice," and was followed by Dr. Campbell in his paper on "The Unexpected Recovery of a Case of Sunstroke."

The following gentlemen's names where then proposed for membership:

Dr. Harry G. Hoover, American Veterinary College, '94, Sterling, Ill., vouched for by Dr. Trumbower; Dr. Chas. W. Johnson, Chicago Veterinary College, '87, Elburn, Ill., vouched for by Dr. A. H. Baker; Dr. E, L. Quitman, Chicago Veterinary College, '91, Chicago, Ill., vouched for by Dr. A. H. Baker; Dr. W. G. Neilson, formerly of Veterinary College, '91, Monmouth, Ill., vouched for by Dr. R. W. Story.

A motion was made by Dr. Wilson, seconded by Dr. Baker, that the above-named gentlemen be elected to membership by acclamation. Carried.

The election of officers resulted in the following named gentlemen being elected for the ensuing year:

President, Dr. M. Wilson, Mendota, Ill.; Vice-preeident, Dr, A. G. Alverson, Bloomington. Ill., Secretary, Dr. A. Babb, Springfield, Ill.; Treasurer, Dr. H. W. Storey, Princeton, Ill.

Board of Consors.—Dr. C. E. Sayre, M. R. Trumbower, J. T. Nattress.

Dr. Wilson taking the chair, Dr. Trumbower made the suggestion that a new association be formed, consisting of members in the Mississippi Valley.

Remarks in favor of such an association being formed were made by various members, and a motion made by Dr. S. S. Baker and seconded by Dr. Trumbower to the effect, that the secretary be instructed to correspond with the secretaries of associations in surrounding states regarding the formation of such an association was carried.

The question of legislation regarding the introduction of a bill, in the Legislature, to regulate the practice of veterinary medicine and surgery in this State was next discussed.

It was found that the members of this association present were in favor of the introduction of such a bill, and a motion

made by Dr. A. H. Baker, seconded by Dr. Scott, that the sum of $10.00 each be subscribed to defray expenses of introducing such a bill, was carried.

Dr. Baker moved and seconded by Dr. Scott that the chair appoint a committee of three, to be known as the Committee on Legislation, and such committee be given power to act. Carried.

The chair appointed as such committee, Drs. S. S. Baker, John Scott and J. T. Nattress.

Bills to the amount of $50.85 were audited and ordered paid.

The following standing committees were then appointed:

Committee on Programme.—Drs. S. S. Baker, J. T. Nattress, T. J. Gunning,

Committee on Arrangements.—Drs. John Scott, A. H. Baker, H. R. Trumbower.

Committee on Membership.—Drs. J. L. Taylor, A. M. Story, W. J. Martin.

A vote of thanks was tendered the retiring officers for efficient services, also to the essayist, and to the proprietors of the hotel for their accomodations.

The meeting then adjourned to come together at the call of the committee in Peoria next February.

MATTHEW WILSON, M.R.C.V.S., *Sec.*

OBITUARY.

DR. GEORGE A. PETERS.

Dr. George A. Peters, one of the trustees of the American Veterinary College, died recently in New York. Though not a veterinarian, Dr. Peters took a great interest in the work done by the institution to which he belonged, and was a close observer of the progress of veterinary medicine in the United States. His death makes vacant a seat which can be filled by another good man, but by no one more enthusiastic than he was.

PROF. WALLEY OF THE ROYAL DICK COLLEGE.

At the last hour going to press the news reaches us of another great loss in the veterinary profession by the death of Prof. Walley, which took place on the 10th of December.

SUNDRY CLIPS AND NOTES.

TRICHINA IN THE HORSE.

It is a common custom in America as well as in England to find that veterinary editors are attached to agricultural or sporting papers with various objects, the main one being to give gratuitous advices, as answers to inquirers having animals ailing with various diseases. It is not our object to consider the propriety of such work, which, in many instances, is of no advantage to the inquirer, we fear of little advantage to the proprietor of the journal, of small pecuniary results to the person who gives the answer, and we have no hesitation to consider, at the very least, a breach of professional etiquette.

But this, right or wrong as it may be, it seems to us that it would become the veterinary editor of some of our agricultural papers to watch at the issue which may be sent broadcast in the issue of the journal to which he belongs.

These remarks are suggested to us by the reading of an article in the *National Stockman and Farmer*, where, out of an editorial on "Horseflesh for Food," we find this sentence: "The medical men warn the eaters of horse-flesh that the horse is peculiarly liable to the disease known as trichinosis. . . . ." Of course, the time has not come yet when in this country horseflesh will be admitted as one of the various meats found in our butchers' shops and, therefore, little danger will ever exist from its use; but if there is ever to be one, it certainly will not be found in the presence of the trichina spiralis.

TUBERCULOUS MEAT: IS IT UNFIT FOR FOOD?

Leclainche, of Toulouse (*Revue de la Tuberculose*. July, 1894,

p. 133), collates the results of many experiments, and considers that there are no authentic cases of tuberculosis arising from the ingestion of diseased beef, and that it is very rare that we can experimentally transmit the disease even by inoculating diseased meat into Guinea-pigs, the most susceptible of all animals to the infection. It is proper to authorize the consumption of all tuberculous meat after it has been completely sterilized by heat, says Leclainche.—*Medical Record.*

METHOD OF DESTROYING CARCASSES OF DISEASED ANIMALS AT HAMBURG.

This usually difficult task is said to become an easy, successful process by the use of a destructor made at Augsburg by Riedinger. It consists or a large iron cylinder or drum, horizontally placed, and revolved by a two-horse-power engine. This cylinder is approached from above, and there is an opening in the side through which the matter to be destroyed is introduced. At each operation three tons can be treated. Plates are arranged inside to throw the mass toward the center. At the beginning steam under pressure is introduced for two hours and a half into the inside of the cylinder. Then, at a pressure of two or three atmospheres, steam is sent into the jacket surrounding the cylinder. By a clever arrangement the fat is extracted, the gases are drawn into the chimney and rendered inoffensive, and the waste matter is converted rapidly into valuable manure in the form of a brown powder. Such destruction of carcasses cost the city much money formerly, but this apparatus yields a profit of $2,500 dollars per year, not allowing for cost and salary. New machines are being constructed with notable improvements.

Condemned meat is sprinkled with petroleum (or crude carbolic acid) after being incised. These permeate the mass and preclude the possibility of its being accepted as food.—*Ibid.*

MISSOURI STATE BOARD OF AGRICULTURE.

Twenty-sixth Annual Report—from which we extract:

From the report of State Veterinarian Dr. J. T. Turner, we find that the live stock of the State is in a very satisfactory condition from a sanitary standpoint. The figures obtained show:

Diseases treated	in 1892,	29;	in 1893,	24
Contagious diseases	"	4;	"	3
Glanders and farcy	"	187;	"	109
Tuberculosis	"	111;	"	3
Actinomycosis	"	27;	"	2
Texas fever	"	327;	"	5

The improved condition in the health of the live stock of the State and the decrease in number of contagious diseases and number of affected animals, is no doubt due to the value of our veterinary service and the watchfulness and efficiency of the State Veterinarian.

CORRECTION.

NOTES ON SO-CALLED SLOW FEVER.—On page 592 the word *impotent* in the eighth line from the bottom of the page should read *putrid*, and in the second prescription, page 593, the words *Liq. potass arsenic* should read *Liq. potass arsenitis*.

PRESCRIPTIONS.

The following, taken from some of our exchanges, can find that application in our practice:

For ozema—℞.

Acidi carbolic,	gr. xvx.
Resorcin (erys.)	gr. xiv.
Glycerni,	℥ iss.
Aqua, g. s. ad.	℥ xii. M.

To be used as a spray.

For eczema—when there is abating of the inflammation:

	℞.	Sulphur (washed).	1	part.
		Zinci oxidi,	4	"
		Vaseline,	39	"
Or again	℞.	Acidi Salicylic,	1	"
		Zinci oxidi,	40	"
		Vaseline,	300	" Mix.

ASSISTANTSHIP WANTED

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